IFSO

XXIX IFSO World Congress

1-4 September 2026 | Toronto, Canada

Advancing Outcomes in Sleeve Gastrectomy Revision

A Comparative Exploration of Ring-Augmented Approaches

Prof. Mohamed Hany, MD

Medical Research Institute, Alexandria University, Egypt

TORONTO 2026

The Future of Obesity Management:
From Weight Loss to Health Gain

ifso2026.org

Disclosure

No financial disclosure

No conflicts of interest relevant to this presentation

Sleeve Gastrectomy: Effective, but Not Always Durable

27.8%

Recurrent weight gain after sleeve gastrectomy

19.9%

Revision rate after sleeve gastrectomy

13.1% / 2.9%

Revision for recurrent weight gain / for GERD

Mechanism is anatomical as well as behavioral: progressive sleeve dilation and adaptation of restriction drive late loss of restriction

Long-term pooled data on sleeve gastrectomy outcomes (Clapp et al., meta-analysis)

Clapp B, et al. Long-term (≥7 years) outcomes of sleeve gastrectomy: a meta-analysis. Surg Obes Relat Dis 2018;14(6):741–747

Revisional Options After an Unsuccessful Sleeve

IFSO
XXIX IFSO World Congress
1-4 September 2026
Toronto, Canada

SG unsuccessful outcome → **Re-SG** → **RYGB** → **OAGB** → **SADI-S** → **BPD-DS**

Lower procedural burden → greater weight-loss potency

Reflux-dominant
Favors RYGB

Weight-dominant
Favors OAGB / SADI-S

Anatomical dilation
Re-sleeve is an option

None of these options completely eliminates recurrent weight gain

Małczak P, et al. Revisional procedures after sleeve gastrectomy: Bayesian network meta-analysis, 23 studies / 3,266 patients. Obesity Reviews 2025

- Conversion does not eliminate late recurrent weight gain
- Recurrent weight gain occurs in up to 40% of patients after RYGB

The question is no longer whether to convert — but how to make conversion durable.

Salminen P, Kow L, Aminian A, Kaplan LM, Nimeri A, Prager G, Behrens E, White KP, Shikora S; IFSO Experts Panel. IFSO Consensus on Definitions and Clinical Practice Guidelines for Obesity Management-an International Delphi Study. Obes Surg. 2024

Hehl, S.J., Birrer, D.L., Hauser, R. *et al.* Gastric Pouch Resizing for Recurrent Weight Gain After Roux-en-Y Gastric Bypass—Does It Have Its Rational?. *OBES SURG* **34**, 4369–4377 (2024). https://doi.org/10.1007/s11695-024-07581-y

Ring Augmentation: Structural Reinforcement, Not Adjustable Banding

Standard sleeve / pouch

Progressive dilation of the reservoir and outlet
Loss of calibrated restriction over time
Late recurrent weight gain

Ring-augmented sleeve / pouch

Fixed, non-adjustable ring around pouch
Resists progressive dilation
Geometry preserved over years

Not an adjustable gastric band

Fixed circumference • no port, no adjustment • not intended to exert continuous compressive force — the purpose is to resist dilation and preserve geometry

Ring-augmented sleeve gastrectomy: favorable trend, not yet proven

IFSO GRADE-based ring-augmentation position statement · Van Dam et al., Obesity Surgery 2026

XXIX IFSO World Congress
1-4 September 2026
Toronto, Canada

Evidence base

8 primary raSG studies

2,181 patients

7 direct comparisons with standard SG

Follow-up: 1–5 years

Ring types: MiniMizer, GaBP, and PTFE rings

Only 1 of 8 raSG studies is an RCT

Pooled weight-loss signal in raSG vs standard SG

Only %TWL could be pooled; %EWL data too limited for meta-analysis

+4.04% %TWL

not significant · 95% CI -5.31–13.38 · I^2 81.3%

Safety and certainty constraints

0–11.8%
reported ring-removal range

5 of 8
studies reported ring-removal data

Not rated
GRADE certainty for the **efficacy** of the ring

Not rated
GRADE certainty for **safety** of the ring

No GRADE certainty rating exists for raSG; data remain too limited for formal recommendations.

Interpretation

IFSO notes a consistent trend favoring raSG over standard SG

Key nuance: the pooled %TWL benefit (+4.04%) did not reach significance (95% CI crossing zero) and heterogeneity was high (I^2=81.3%); raSG data were too sparse for a GRADE rating.

Source: van Dam KAM et al. Ring-augmented MBS procedures: GRADE-based IFSO Position Statement. Obesity Surgery. 2026;36:1644–1656. doi:10.1007/s11695-026-08556-x

Primary ring-augmented RYGB: strongest evidence, but still selective

IFSO GRADE-based ring-augmentation position statement · Van Dam et al., Obesity Surgery 2026

XXIX IFSO World Congress
1-4 September 2026
Toronto, Canada

Evidence base

14 primary raRYGB studies

4,330 patients

Pooled weight-loss signal in RaRYGB vs standard RYGB

+7.9% %EWL

95% CI 1.9–13.9 · I^2 56.4%

+8.84% %TWL

≈5 years · 95% CI 5.82–11.87 · I^2 34%

Safety and certainty constraints

0–21.7%
reported ring-removal range

129/2041
rings removed during follow-up

Moderate
GRADE certainty for the **efficacy** of the ring

Low
GRADE certainty for **safety** of the ring

Interpretation

IFSO supports selective use in patients at high risk of recurrent weight gain — not routine adoption.

van Dam KAM et al. Obesity Surgery 2026;36:1644–1656

TORONTO2026 The Future of Obesity Management: From Weight Loss to Health Gain

PRACTICE RELEVANCE

Revisional / Conversional raRYGB in the IFSO Position Statement

IFSO
XXIX IFSO World Congress
1-4 September 2026
Toronto, Canada

- Only three revisional/conversional raRYGB cohorts exist (n = 50, 62, 79)
- Cumulative weight loss 26.9–32.9% TWL at 1–3 years; ring removal 0–23%
- IFSO: not routinely recommended — specialized centres, trials or registries

Study	Procedure	n	Follow-up	Weight-loss finding	Major complications	Ring removal
van Dam et al. 2024	SG → raRYGB	50	1 year	17.8% TWL; 32% cumulative TWL	16%	6%
Bhandari et al. 2022	SG → raRYGB	62	3 years	14.5% TWL; 26.9% cumulative TWL	NA	0%
Boerboom et al.	RYGB → raRYGB	79	2 years	26% cumulative TWL	32.9%	23%

van Dam KAM et al. Obesity Surgery 2026;36(4):1644–1656

Our MDCT Volumetry Cohort: Dilation Is Blunted

Retrospective cohort 2016–2017 · 1,279 SG vs 132 Ra-SG · 3D volumetry at 6 months, 1 year and 4 years

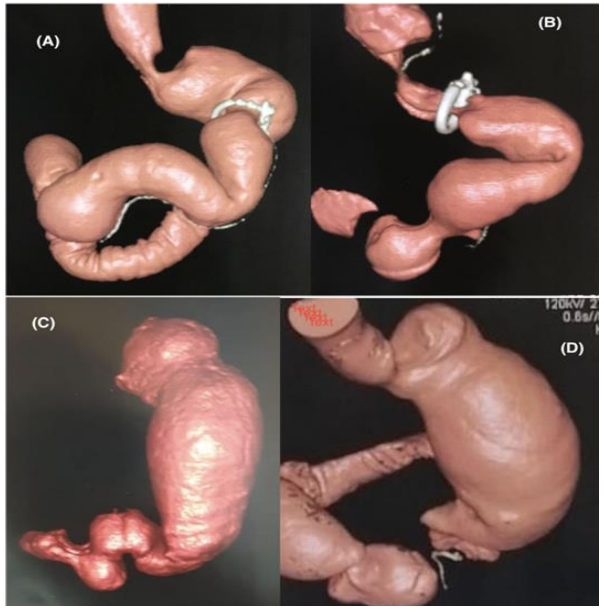
Sleeve volume at 4 years
SG 580 ± 112 mL — **Ra-SG 158 ± 13 mL**
3.6× smaller · p < 0.001

Recurrent weight gain
SG 7.0% — **Ra-SG 0%**
p = 0.002

Conversion to RYGB
SG 171/1,279 (13.4%) — **Ra-SG 0**
weight regain and/or GERD

Suter food tolerance, 4 years
SG 23.8 — **Ra-SG 21.5**
worse with the ring · p < 0.001

Hany M, et al. CT volumetry of ring-augmented versus standard sleeve gastrectomy. Obes Surg 2023



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]

The Efficacy Gap Widens After the First Year

The difference in %EWL between Ra-SG and SG becomes significant at 12–24 months and increases through year 5

Year 1

No significant difference

Early weight loss is comparable between Ra-SG and standard SG

Years 1–3

18.43%

Mean difference in %EWL in favor of Ra-SG (Al-Juhani et al., 2024)

Years 3–5

SMD 29.85

Standardized mean difference in favor of Ra-SG — the advantage grows further (Facciorusso et al., 2022)

The primary benefit is not accelerating initial weight loss — it is maintaining that loss and preventing long-term regain

Al-Juhani et al. 2024 · Facciorusso et al. 2022 — systematic reviews and meta-analyses of ring-augmented sleeve gastrectomy

Durability Has a Functional Cost

BENEFIT	COST
Weight stability	**Food intolerance**
Less sleeve / pouch dilation Lower rate of post-nadir regain Durable restriction over years	Lower food tolerance scores at every follow-up Dysphagia, regurgitation, vomiting Grazing and behavioral adaptation

Consistent across the primary SG trial, the re-sleeve trial and comparative series — the success of ring augmentation cannot be judged by weight alone

IFSO
XXIX IFSO World Congress
1-4 September 2026
Toronto, Canada

From Revisional Options to Ring-Augmented Revision

Ring-augmented re-sleeve gastrectomy → ring-augmented conversional Roux-en-Y gastric bypass

TORONTO2026 The Future of Obesity Management: From Weight Loss to Health Gain

SG-to-RYGB: Common, but Durability Remains a Question

62%

of typed revisional / conversional procedures worldwide are RYGB

10th IFSO Global Registry

Sleeve gastrectomy

↓

RWG / SOWL / GERD

↓

Conversion to RYGB

↓

Durability? RWG is not eliminated

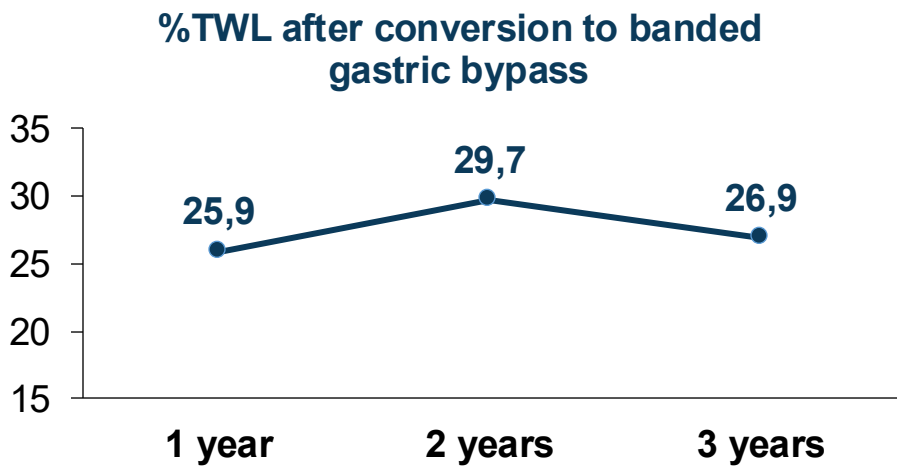
Ring-Augmented Gastric Bypass After Unsuccessful Sleeve

Bhandari M, et al. Indian single-center experience · 62 patients converted from SG to ring-augmented gastric bypass

ORIGINAL ARTICLE · World J Laparosc Surg 2022;15(1):50–53

Conversion to a Ring-Augmented Gastric Bypass is a Safe and Effective Option after Sleeve Gastrectomy: An Indian Single-center Experience

Bhandari M, Kosta S, Reddy M, Mathur W, Bhandari M ·
doi:10.5005/jp-journals-10033-1503



Technique
7-cm GaBP ring placed 3–5 cm below the GEJ and fixed to the staple line; Roux limb 120 cm, BP limb 80 cm

Population
62 patients, mean time to revision 27.0 ± 13.1 months; pre-SG BMI 41.7 ± 8.1 kg/m²

Comorbidity
Type 2 diabetes resolved in 70%, hypertension in 78.6%

Safety
All revisions laparoscopic · no early or late complications, no mortality

Bhandari M, Kosta S, Reddy M, Mathur W, Bhandari M. Conversion to a ring-augmented gastric bypass is a safe and effective option after sleeve gastrectomy. World J Laparosc Surg 2022;15(1):50–53. doi:10.5005/jp-journals-10033-1503

Trial registration number
NCT07436013

IFSO
XXIX IFSO World Congress
1-4 September 2026
Toronto, Canada

In SG-to-RYGB Conversion, Should We Add a Ring?

Does ring augmentation improve five-year weight-loss durability and reduce recurrent weight gain after conversion?

Primary endpoint

Five-year %TWL calculated from the pre-conversion weight

Secondary endpoints

Recurrent weight gain • food tolerance • ring-related events • nutritional safety • re-interventions • overall complications

Trial registration number
NCT07436013

XXIX IFSO World Congress
1-4 September 2026
Toronto, Canada

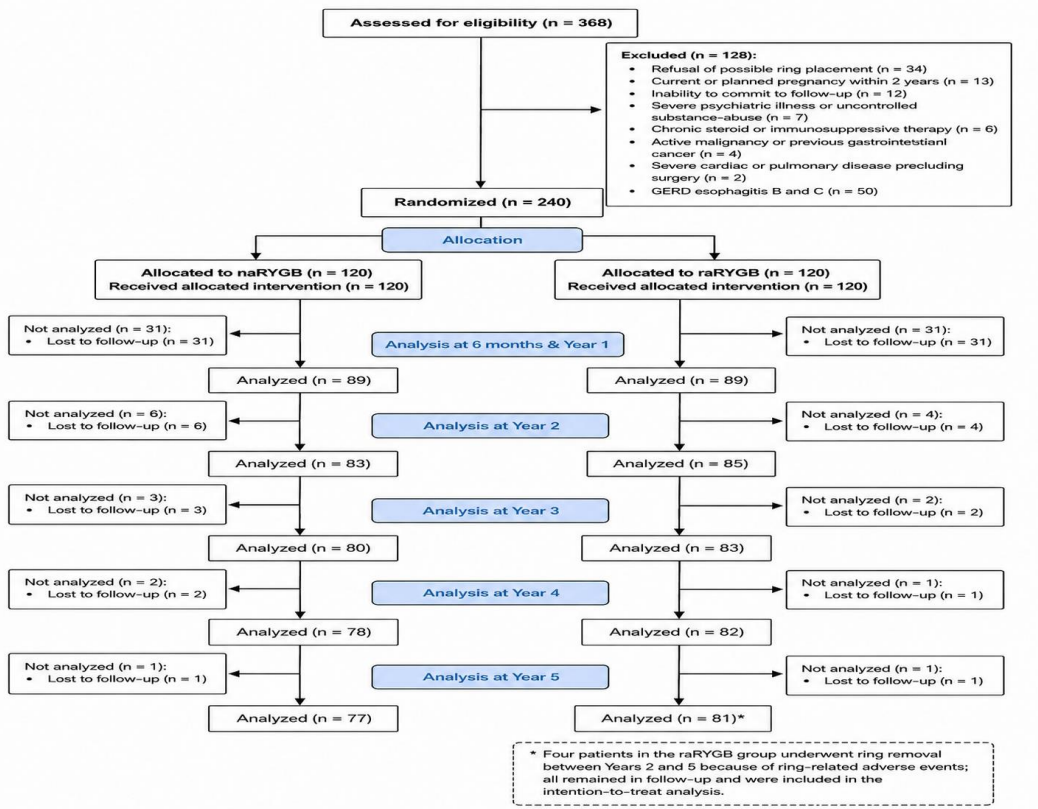
Conversional RYGB Trial: Randomized 1:1

368 assessed for eligibility

240 randomized 1:1

120 / 120 naRYGB / raRYGB

158 with five-year data



Standardized technique in both arms — comparable pouch construction and limb lengths; in the ring arm the ring was applied and fixed to prevent migration

TORONTO2026 The Future of Obesity Management: From Weight Loss to Health Gain

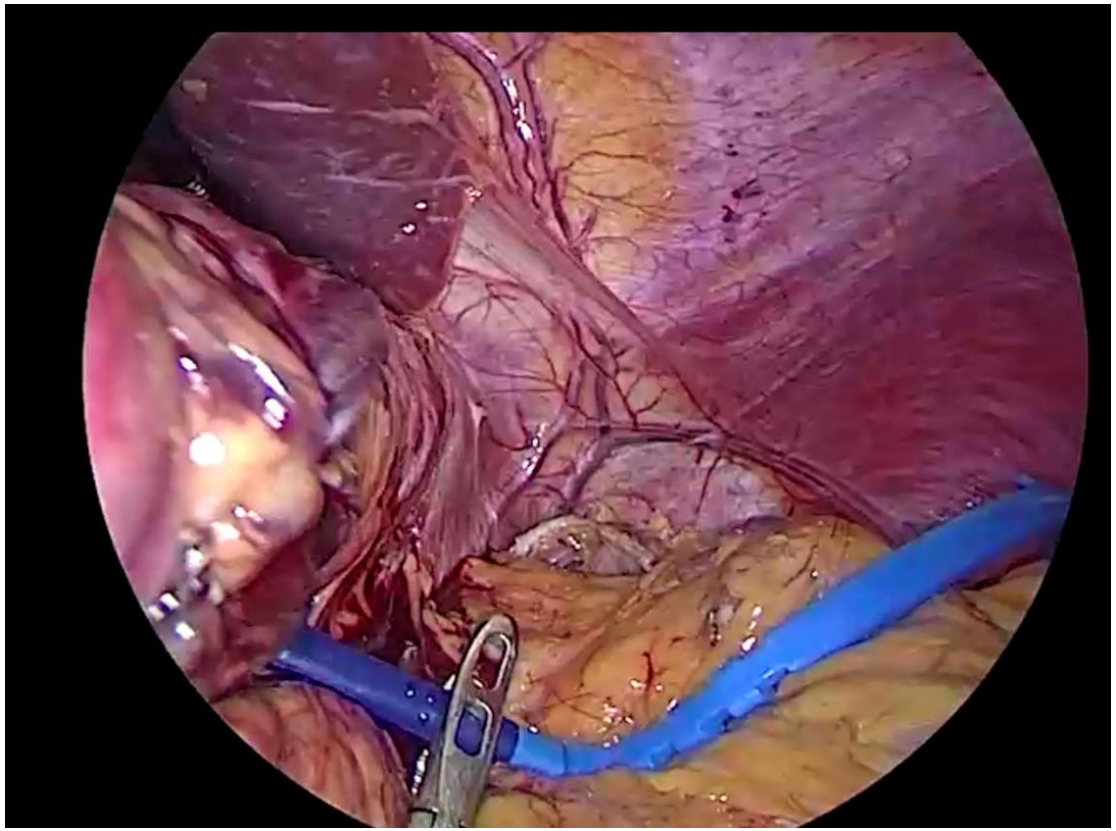
Recruitment August 2018 – November 2020 · unpublished data

Ring placement: pouch preparation and tunnel

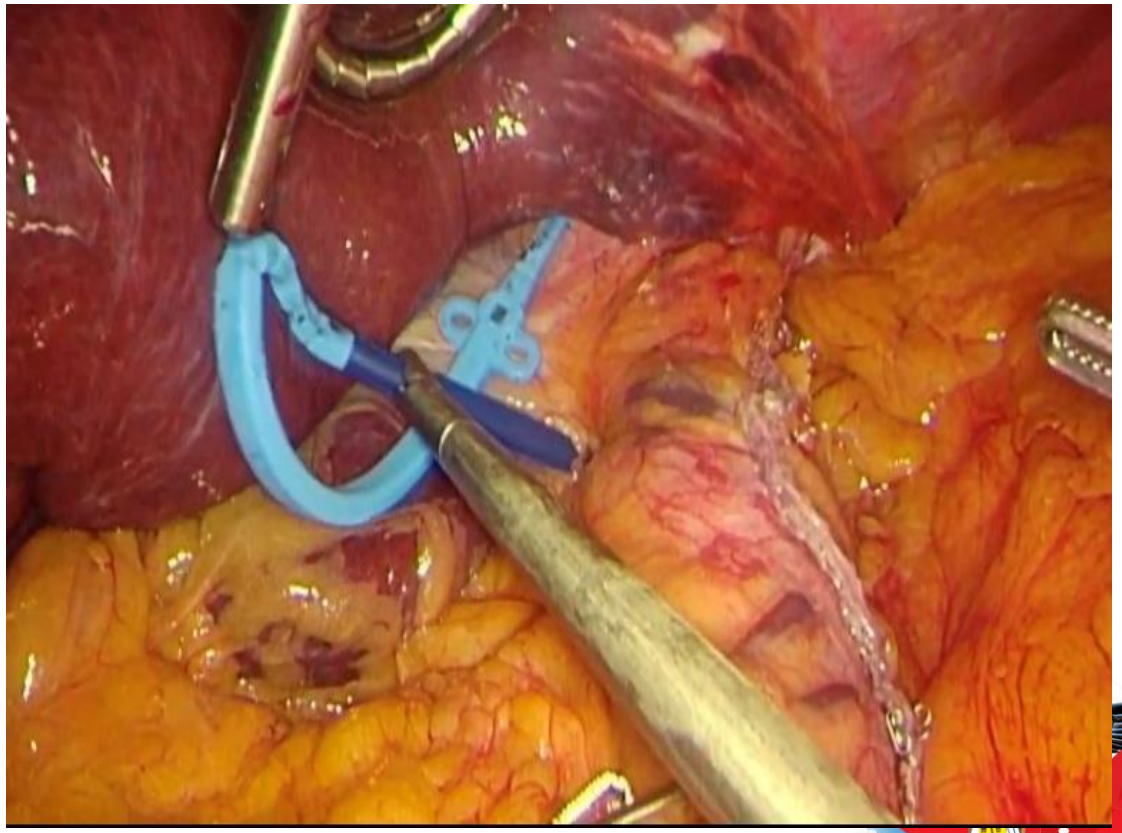
IFSO
XXIX IFSO World Congress
1-4 September 2026
Toronto, Canada

- Dissect the lesser sac below the 2nd vein for ring insertion, then below the 3rd vein to create a long pouch
- Pouch length 8–10 cm above the gastro-jejunostomy

Pars flaccida — via the gastro-hepatic ligament



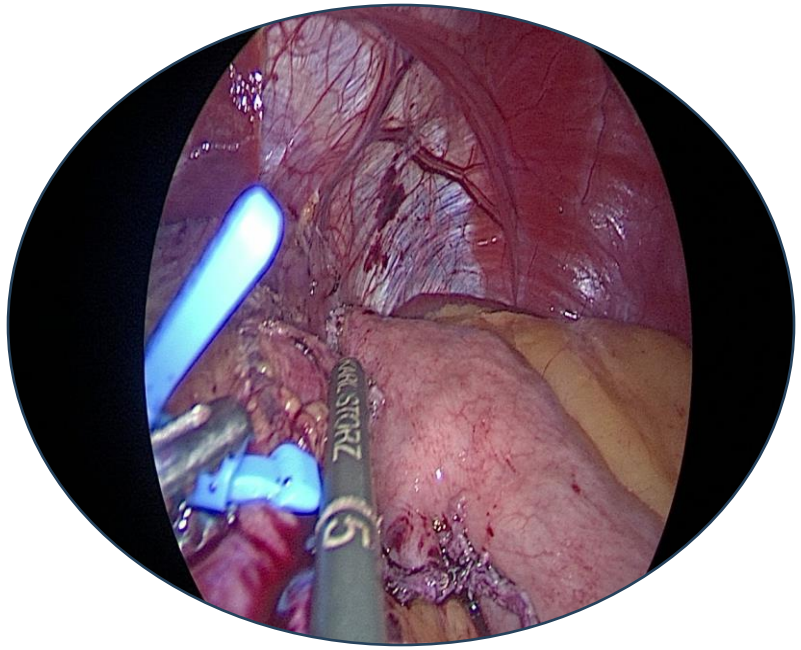
Perigastric tunnel — created close to the gastric wall



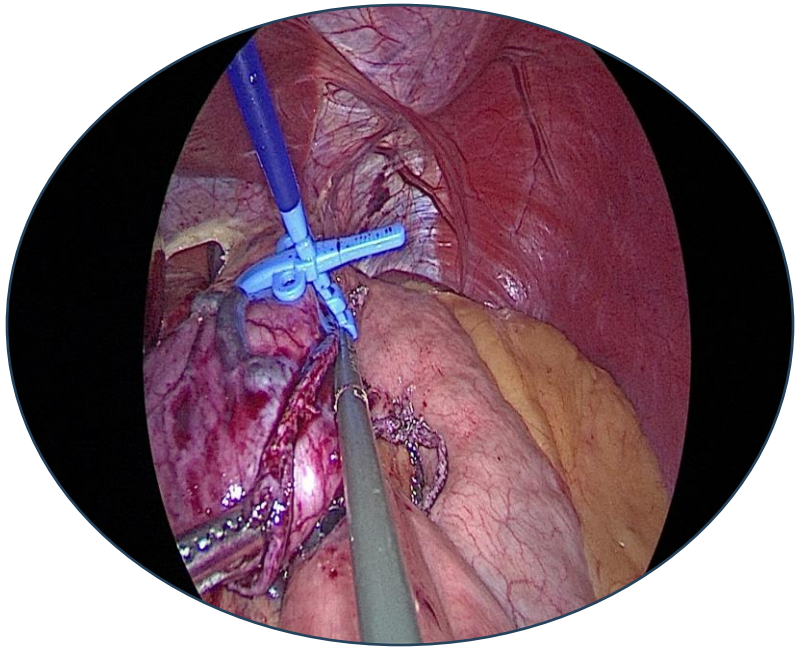
Ring application and fixation

IFSO
XXIX IFSO World Congress
1-4 September 2026
Toronto, Canada

Ring applied and tightened 4–5 cm below the GEJ, then fixed



Prevents migration of the alimentary limb between pouch and ring

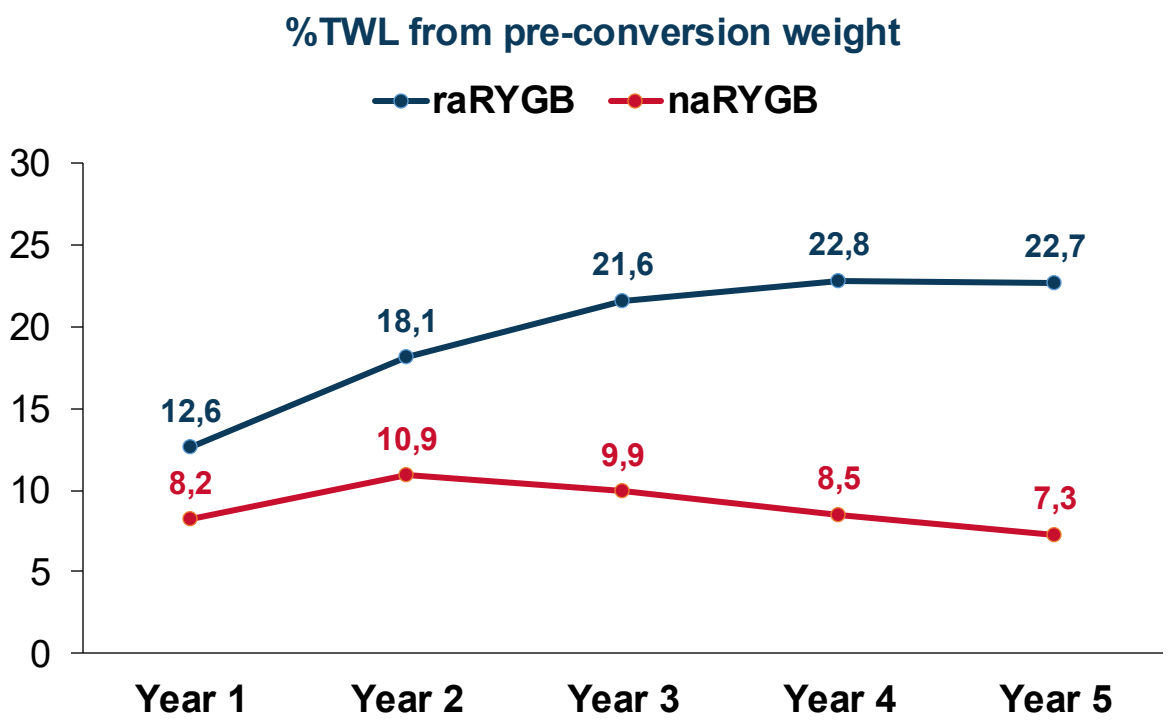


- Avoids a short pouch that may encroach on the anastomosis
- Non-absorbable sutures through the built-in ring holes prevent long-term slippage
- Remove perigastric fat for direct ring-to-gastric-wall contact; trim ring ends only if needed

Trial registration number
NCT07436013

XXIX IFSO World Congress
1-4 September 2026
Toronto, Canada

Five-Year %TWL: The Curves Separate Over Time



raRYGB
22.7%

naRYGB
7.3%

Mean difference
15.1 points · p < 0.001

%TWL from pre-conversion weight, five years after SG-to-RYGB conversion

TORONTO2026 The Future of Obesity Management: From Weight Loss to Health Gain

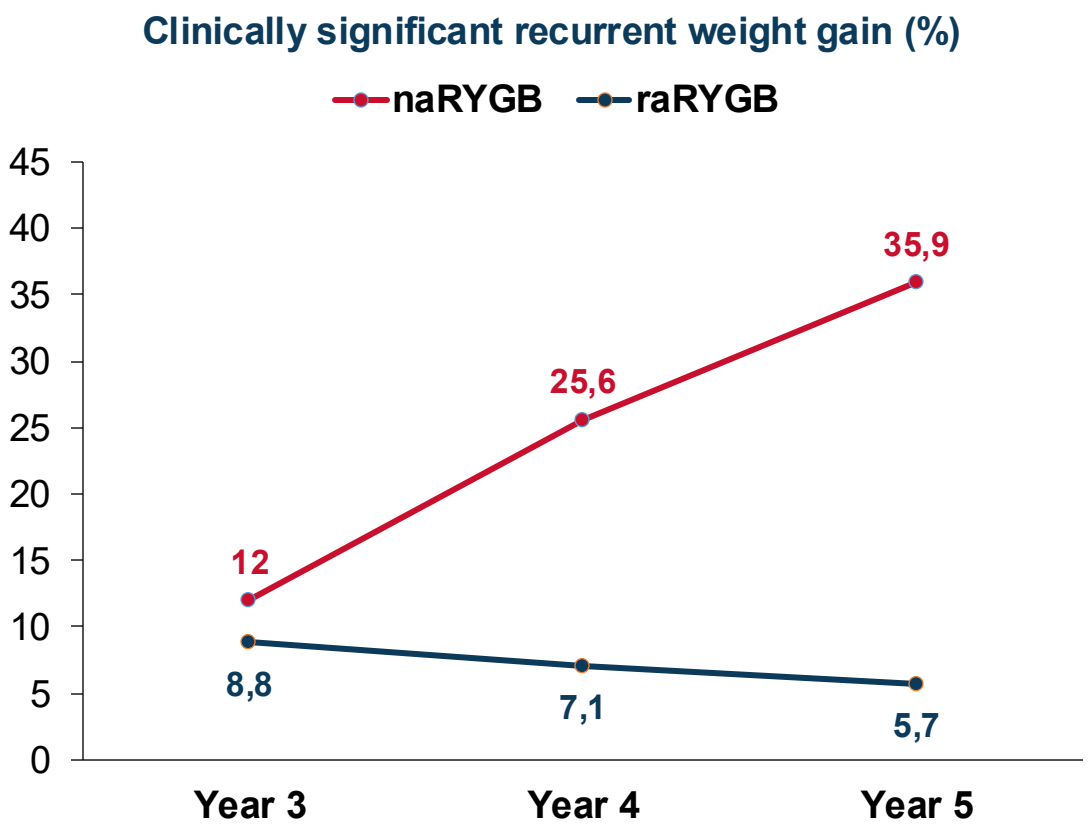
Between-group MD 15.10 points (95% CI 12.15–18.05) · NCT07436013 ·

Trial registration number
NCT07436013

XXIX IFSO World Congress
1-4 September 2026
Toronto, Canada

Reduced Post-Nadir Recurrent Weight Gain

Any recurrent weight gain from nadir, five years after SG-to-RYGB conversion



naRYGB

74%

of patients with recurrent weight gain

raRYGB

9.9%

of patients with recurrent weight gain

The ring adds value by limiting late loss of restriction and post-nadir regain — the same theme seen in primary SG and in re-sleeve

Trial registration number
NCT07436013

IFSO
XXIX IFSO World Congress
1-4 September 2026
Toronto, Canada

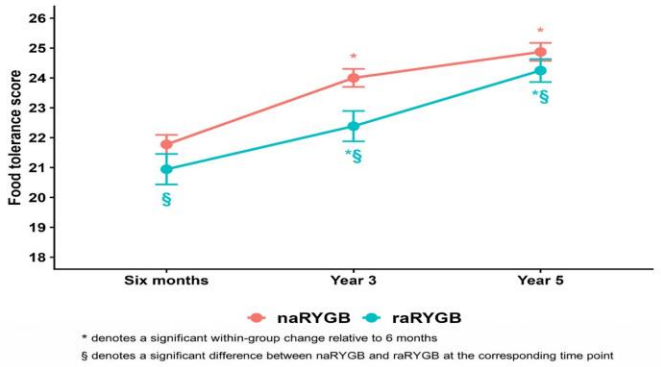
Better Durability, a Measurable Tolerance Penalty

Functional outcomes

Food tolerance lower in the ring-augmented arm
Quality-of-life and BAROS scores improved in both groups
Counseling on eating behaviour is essential

Safety

Early and late complication rates comparable
No erosion, slippage or ring-attributable mortality
Ring removal in a small number: dysphagia, food intolerance, stenosis



Metabolic, hormonal, nutritional and endoscopic outcomes were broadly similar between groups

The difference was a weight-durability effect, not a new metabolic effect

BAROS weight-loss component, Year 5 median 1.00 naRYGB vs 3.00 raRYGB · NCT07436013 · unpublished data

Re-Sleeve After a Dilated Sleeve: The Revision Setting

1. **Dilated sleeve with recurrent weight gain**
   Anatomical loss of restriction of the original operation

2. **Re-sleeve gastrectomy planned**

   Addresses the anatomy directly and avoids bypass

3. **The question: add a ring, or not?**

   If the first sleeve dilated, what prevents the second from dilating?

Obesity Surgery (2023) 33:2049–2063
https://doi.org/10.1007/s11695-023-06598-z

IFSO

ORIGINAL CONTRIBUTIONS

Check for updates

Two-Year Results of the Banded Versus Non-banded Re-sleeve Gastrectomy as a Secondary Weight Loss Procedure After the Failure of Primary Sleeve Gastrectomy: a Randomized Controlled Trial

Mohamed Hany[1,2] · Mohamed Ibrahim[1] · Ahmed Zidan[1] · Ann Samy Shafiq Agayaby[1] · Moustafa R. Aboelsoud[1] · Muhammad Gaballah[1] · Bart Torensma[3]

Our published randomized re-sleeve trial · Obes Surg 2023

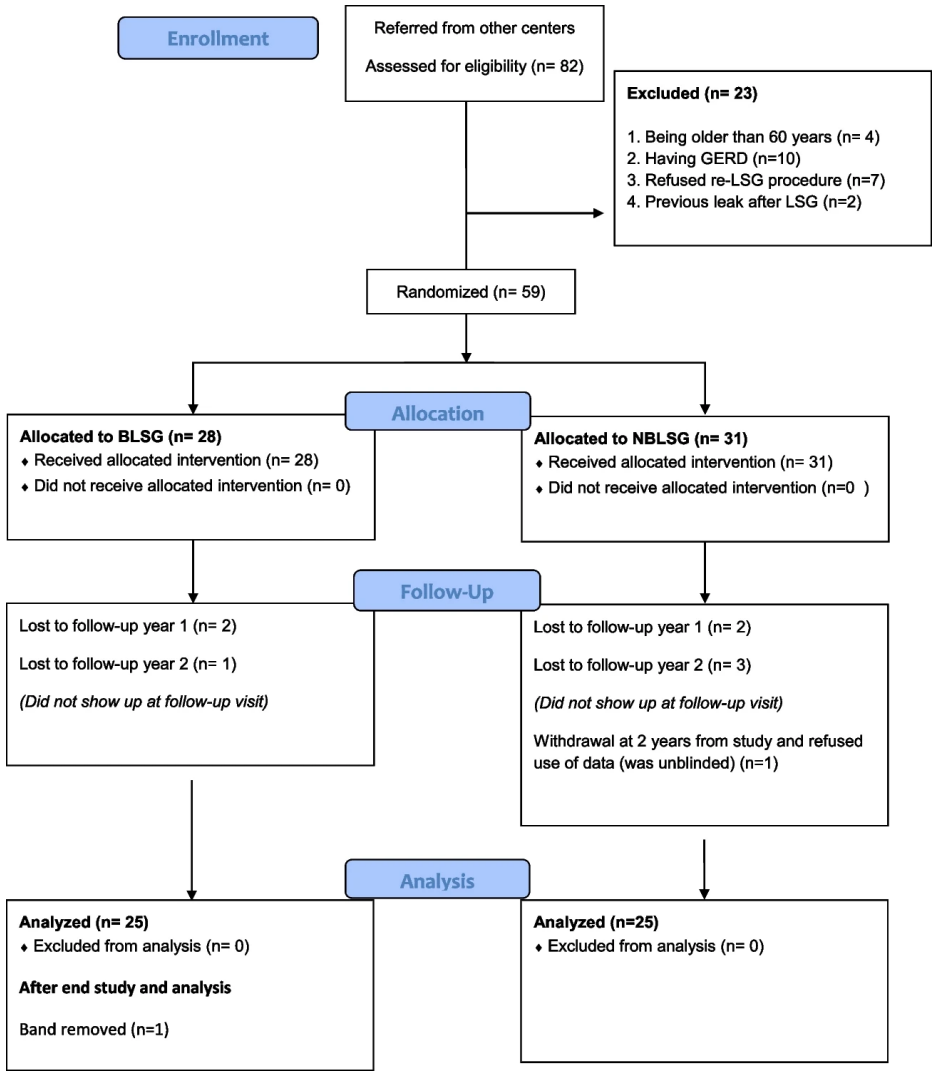
50 patients with a dilated sleeve and recurrent weight gain
25 ring-augmented vs 25 non-ring-augmented re-sleeve · 2-year follow-up
Pre-re-sleeve BMI ≈ 47–48 kg/m², groups comparable

Rationale for the randomized comparison of ring-augmented versus non-ring re-sleeve

A) An MDCT recording of a pre-revisional stomach of a large sleeve gastrectomy with a hiatal hernia.

B) An MDCT recording of a pre-revisional stomach with big volume sleeve gastrectomy with a hiatal hernia.

Trial flow: 59 randomized, 25 analyzed per arm at 2 years



82 assessed → 59 randomized

23 excluded: age >60 (n=4), GERD (n=10), refused re-LSG (n=7), previous leak (n=2)

28 BLSG vs 31 NBLSG allocated

All patients received the allocated intervention

25 + 25 analyzed at 2 years

Losses: 3 BLSG, 6 NBLSG (incl. 1 unblinded withdrawal); 1 band removed after study end

CONSORT diagram · Hany et al., Obesity Surgery 2023

No significant baseline differences between groups

Two-year RCT of banded vs non-banded re-sleeve gastrectomy after failed primary sleeve gastrectomy · Hany et al., Obesity Surgery 2023

IFSO
XXIX IFSO World Congress
1-4 September 2026
Toronto, Canada

Baseline characteristic	Banded re-sleeve (BLSG) N=25	Non-banded re-sleeve (NBLSG) N=25	P value
Age (years), mean ± SD	40.7 ± 11.2	39.7 ± 8.0	.707
Sex (female), n (%)	21 (84.0%)	17 (68.0%)	.321
BMI before 1st surgery (kg/m²)	51.8 ± 4.5	51.4 ± 5.8	.804
BMI before 2nd surgery (kg/m²)	47.7 ± 5.0	46.9 ± 6.1	.589
Time between 1st sleeve and re-sleeve (years)	3.8 ± 0.8	3.8 ± 0.8	.862
Smoking, n (%)	7 (28.0%)	10 (40.0%)	.551
Preoperative stomach volume (mL)	408.0 ± 74.6	410.0 ± 66.1	.921
Preoperative food tolerance score	22.9 ± 0.8	22.9 ± 0.8	1.000

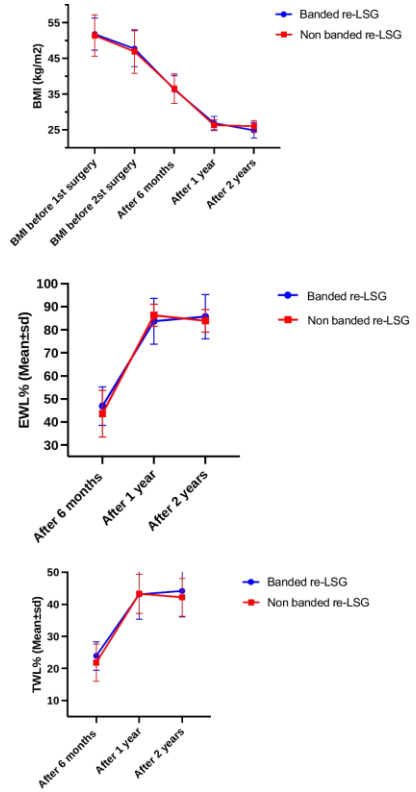
No significant differences in any baseline characteristic (all p ≥ .32) — the two groups entered the trial evenly matched.

Re-Sleeve RCT: Same Early Weight Loss, More Stability

Ring-augmented versus non-ring-augmented re-sleeve gastrectomy — 2-year randomized results

%EWL at 2 years	%TWL at 2 years	Regain 10%, year 2
Non-ring 83.9%	Non-ring 42.2%	Non-ring 80%
Ring 85.7%	Ring 44.2%	Ring 24%
Not significant	*Not significant*	*p = 0.001*

Sleeve volume at 2 years: 194.2 mL non-ring vs 159.6 mL ring — the ring did not change the early result, it stabilized it



BMI, %EWL, %TWL over 2 years (trial figure)

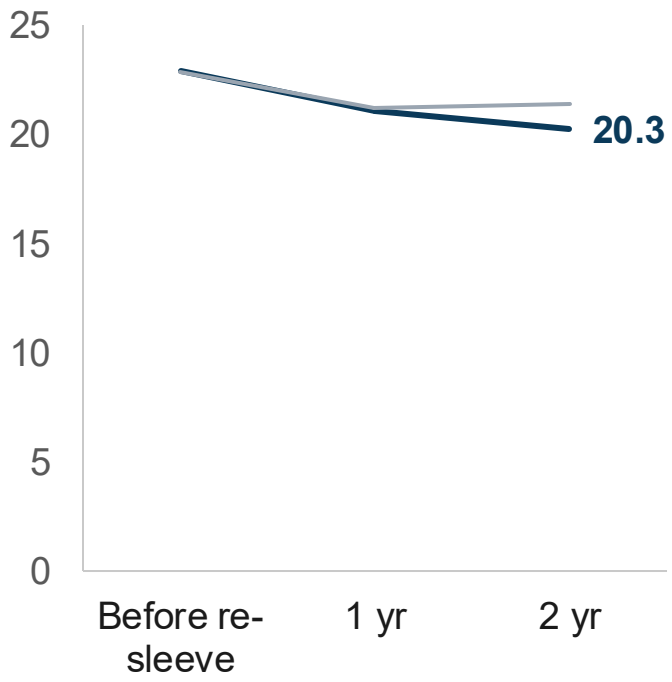
Our randomized trial of ring-augmented vs non-ring-augmented re-sleeve gastrectomy, 50 patients, 2-year results · Obes Surg 2023 · BMI at 2 y 24.9 vs 26.0 kg/m² (p = 0.045)

The ring shrank the stomach further, at a cost to food tolerance

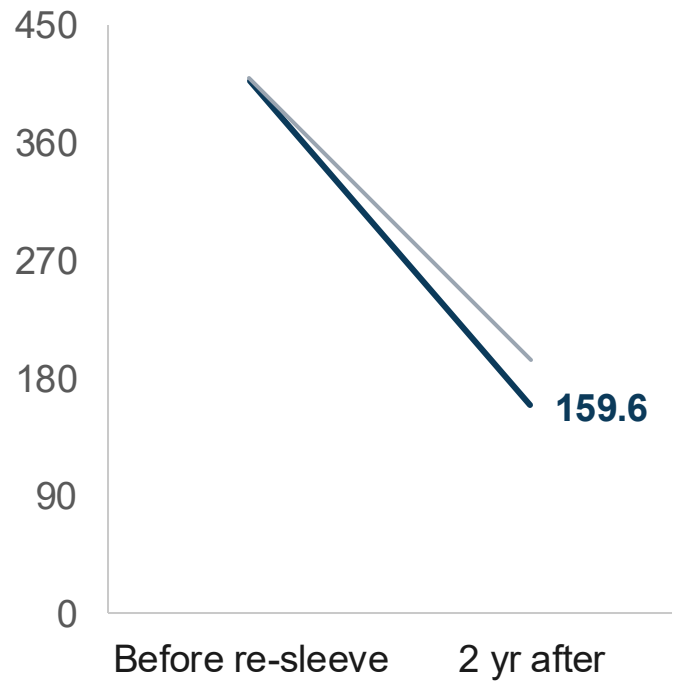
Two-year RCT of banded vs non-banded re-sleeve gastrectomy after failed primary sleeve gastrectomy · Hany et al., Obesity Surgery 2023

Banded re-LSG Non-banded re-LSG

Food tolerance score (2yr: 20.3 vs 21.4, p<.001)



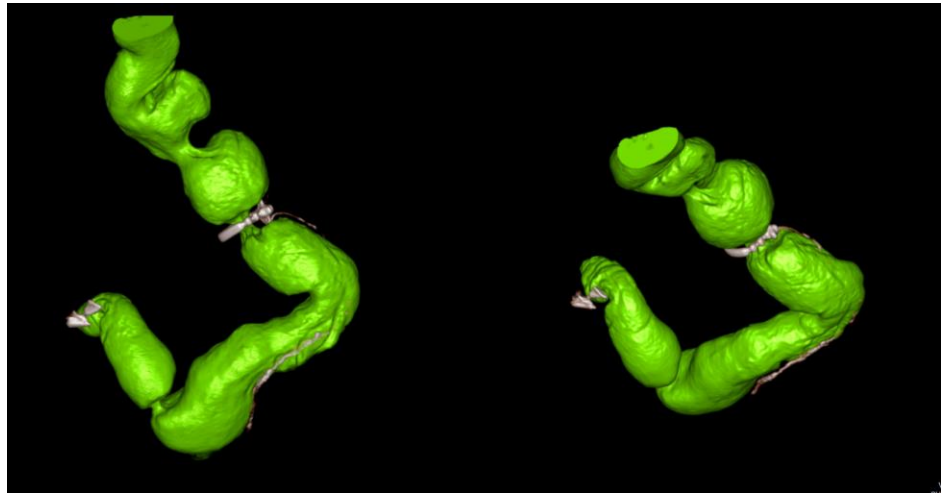
Stomach volume, mL (2yr: 159.6 vs 194.2, p<.001)



Both 2-year differences were significant (p<.001): the band left a smaller stomach (–34.6 mL) but a lower food-tolerance score — 72.4±16.5 mL of that volume sits above the band itself.

CT Volumetry: The Ring Blunts Sleeve Expansion

MDCT 3D volumetry across our center's cohorts and randomized trials



Sleeve volume at 2 years: 194.2 mL non-ring vs 159.6 mL ring — the ring did not change the early result, it stabilized it

Volume expansion is dramatically blunted by the ring — the anatomical basis of the durability signal

Re-sleeve RCT, Obes Surg 2023

Where We Use the Ring — and Where We Think Twice

IFSO
XXIX IFSO World Congress
1-4 September 2026
Toronto, Canada

FAVOR THE RING

High-risk phenotype for recurrent weight gain
BMI > 50 kg/m², strong hyperphagic pattern
Dilated sleeve undergoing re-sleeve
Patient refuses conversion to a bypass yet still needs durable restriction
Center with reliable long-term follow-up and access to endoscopy and CT

THINK TWICE

Grazing, vomiting, food anxiety
Severe reflux, Barrett's, large hiatal hernia
Known esophageal motility disorder
Strong rejection of a foreign body

Selection criteria used in our practice, 2026 · Alexandria Medical Research Institute

Selective Strategy, Not Routine Addition

Current evidence does not support routine ring placement in all revisional procedures. ***Use it selectively***, in experienced centers, with structured follow-up and the ability to manage intolerance or remove the ring.

Future directions

Longer follow-up
Beyond five years

Multicenter replication
Outside single expert centers

Patient selection
Predictors of benefit and of intolerance

Broader endpoints
PROs, nutrition, cost-effectiveness

Obesity management medications (OMMs) as a complementary tool — combined ring + OMM strategies remain to be studied

van Dam KAM, De Luca M, Monami M, et al. Ring-augmented MBS procedures: GRADE-based IFSO Position Statement. Obes Surg 2026;36(4):1644–1656

Take-Home Message

1. Recurrent weight gain after sleeve gastrectomy is partly an anatomical durability problem
2. Ring augmentation consistently reduces sleeve and pouch expansion
3. In re-sleeve and in conversional RYGB the benefit is durability, not greater early weight loss
4. That durability comes with a real food-tolerance trade-off

The right patient, the right indication, the right ring, the right technique

XXX IFSO WORLD CONGRESS

"Advancing Multimodal Obesity Care"

24-27 August 2027

ifso2027.org

IFSO PARIS 2027

See you in

PARIS