



XXIX IFSO World Congress

1-4 September 2026 | Toronto, Canada

Ring-Augmented versus Non-Augmented Roux-en-Y Gastric Bypass after Sleeve Gastrectomy

Five-Year Outcomes of a Randomized Controlled Trial

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TORONTO2026

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



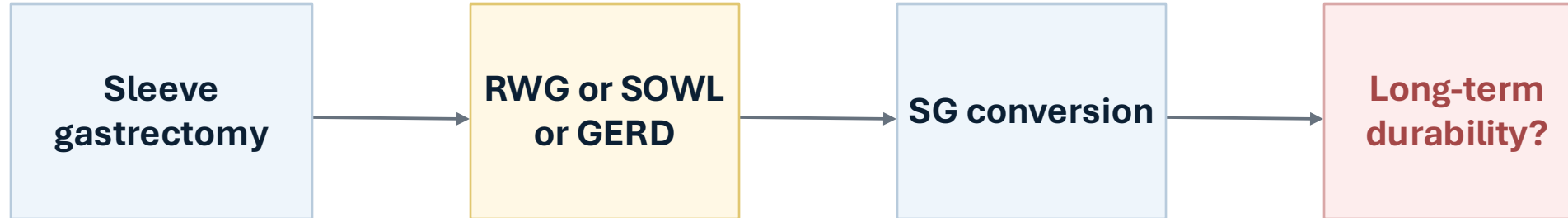
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Disclosure

No financial disclosure.



Long-term durability after SG



- SG is still the most common primary MBS procedure worldwide
- At ≥ 7 years: recurrent weight gain 27.8%, revision 19.9%
- Main drivers of revision: RWG, SOWL and GERD

[1] Brown WA, Liem R, Al-Sabah S, Anvari M, Boza C, Cohen RV *et al*. Metabolic Bariatric Surgery Across the IFSO Chapters: Key Insights on the Baseline Patient Demographics, Procedure Types, and Mortality from the Eighth IFSO Global Registry Report. *Obesity Surgery* 2024, 34(5):1764-1777 doi: 10.1007/s11695-024-07196-3.

[2] 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.

[3] Matczak P, Shim SR, Wysocki M, Rymarowicz J, Wierdak M, Pędziwiatr M *et al*. Comparison of different revisional surgeries after sleeve gastrectomy: A network meta-analysis. *Obesity reviews: an official journal of the International Association for the Study of Obesity* 2025:e13930 doi: 10.1111/obr.13930.

[4] 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



Revisional options after sleeve gastrectomy

A network Meta-analysis (NMA) by Malczak et al.

Malczak et al.
Obesity Reviews
2025

23 studies • 3,266 patients •
Bayesian NMA

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SG
requiring
revision

Weight recurrence /
insufficient loss
GERD or reflux-driven
symptoms
Sleeve anatomy-related
failure

Safety-favoring

Re-SG

Best morbidity rank

Quality of Life favors

RYGB

Benchmark for GERD
/ reflux

Favoring weight loss

OAGB

%EWL MD 8.28 (1.99–
14.30)

SADI-S

%TWL MD 9.27 (1.06–17.8)

BPD-DS

Most malabsorptive;
selected cases

lower procedural burden / morbidity rank

Main NMA message

- SADI-S and OAGB ranked highest for weight loss
- Morbidity did not differ; re-SG ranked best
- RYGB remains the option of choice for reflux

greater weight-loss potency

Malczak et al. Obesity Reviews 2025;26(8):e13930



IFSO Global Registry: what is the most common revisional operation?

10th Global Registry Report · aggregated data from 38 national + 2 regional registries (2024)


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Most common

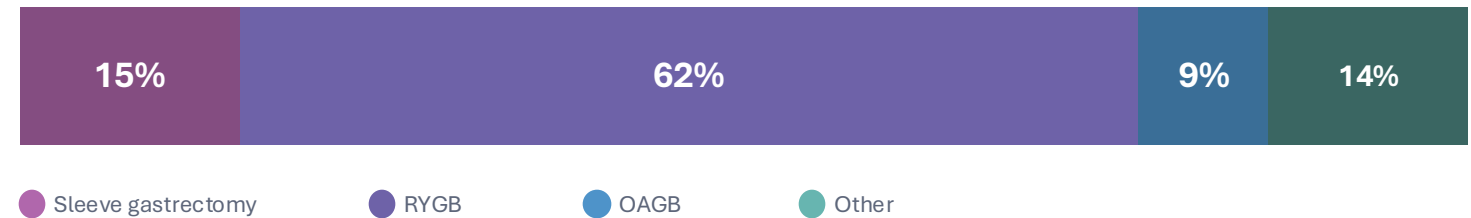
RYGB

Roux-en-Y gastric bypass

62%

of typed revisional
procedures

Procedure distribution among revisional/conversion operations



581,120

total procedures reported by contributing registries
(2024)

7.5%

overall revisional surgery rate

43,303

typed revisional procedures analyzed

IFSO Global Registry Report, 10th edition (2024 data)



- Conversion to RYGB 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: concept and terminology

- A fixed, non-adjustable ring keeps calibrated restriction around the pouch.
- This is a ring — not an adjustable gastric band.

Ring augmentation

**Fixed
non-adjustable**

**Circumferential
reinforcement**



Torensma, Obes Surg 2024 · Hany, Obes Surg 2025 · van Dam, IFSO Position Statement, Obes Surg 2026



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

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

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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



Rationale and equipoise

Potential benefit

- May improve long-term durability and reduce recurrent weight gain.

Potential trade-off

- May reduce food tolerance; occasional ring removal.

Knowledge Gap

- No randomized data on ring placement at SG-to-RYGB conversion.

Hany, Obes Surg 2025 & 2026 · van Dam, IFSO Position Statement, Obes Surg 2026



Study question and hypothesis

In patients undergoing SG-to-RYGB conversion, does ring augmentation improve long-term weight-loss durability and reduce RWG compared with non-augmented RYGB?

Primary Endpoint

Five-year %TWL from pre-conversion weight.

secondary endpoints

RWG · food tolerance · ring-related events · nutrition · re-interventions



Trial snapshot

368

assessed for eligibility

240

randomized 1:1

120

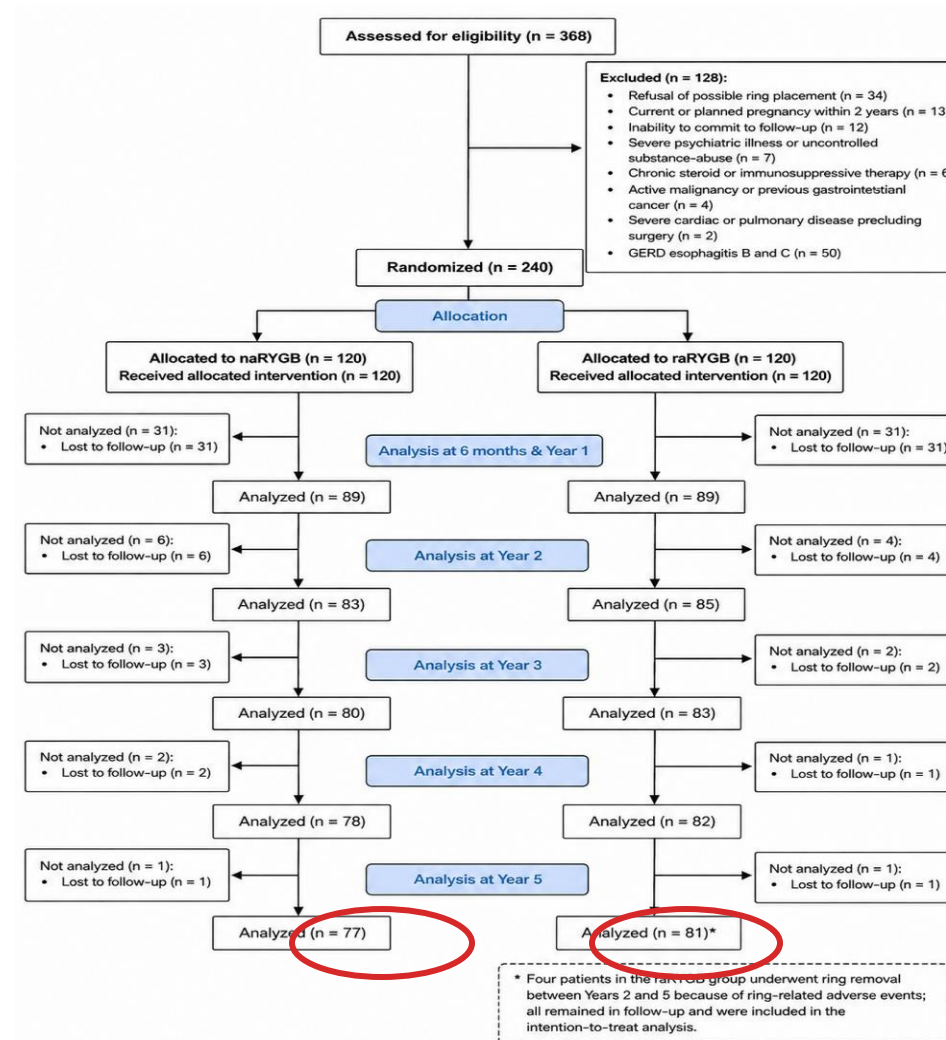
naRYGB

120

raRYGB

158 (66%)

with 5-year data



Recruitment from August 2018
to November 2020
Multicentric



Operative technique

naRYGB arm

Non-augmented conversional Roux-en-Y gastric bypass

- Pouch 8–10 cm, 35–40 mL, 40 Fr bougie
- Alimentary 100 cm, biliopancreatic 100 cm, common ≥ 300 cm
- Gastroenterostomy 2–2.5 cm; mesenteric defects closed

raRYGB arm

Ring-augmented conversional Roux-en-Y gastric bypass

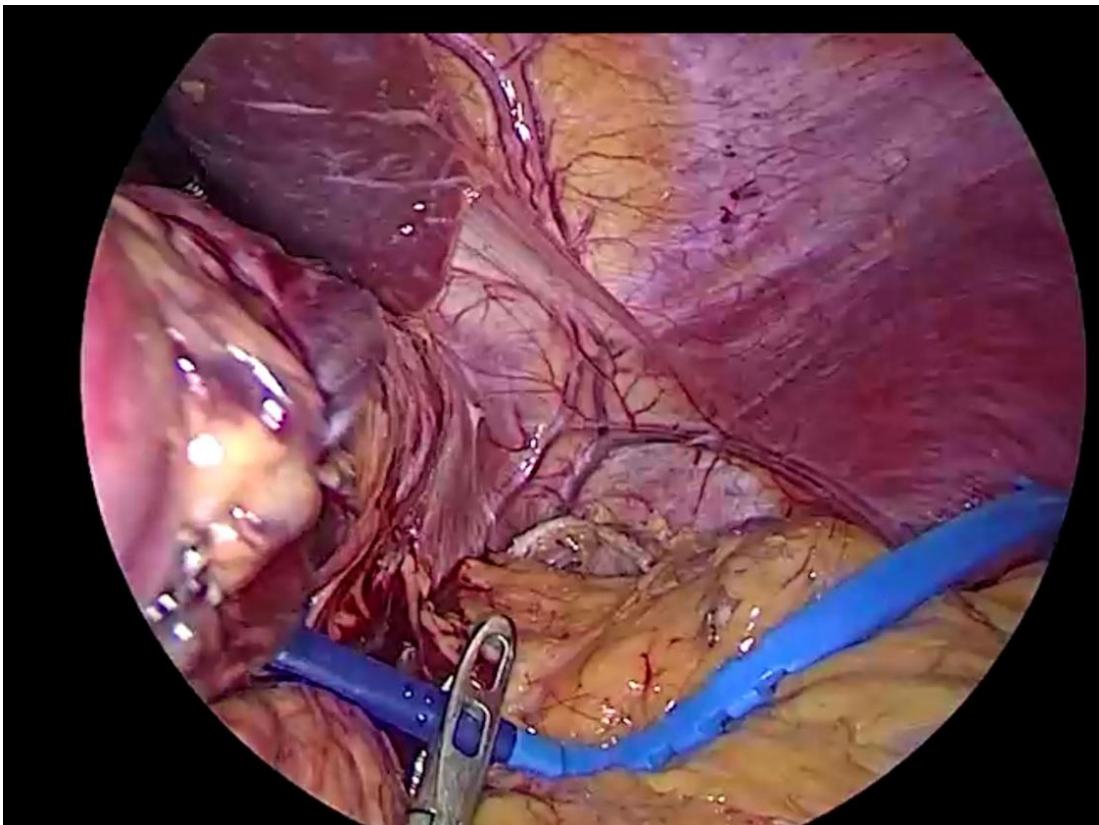
- Identical pouch, limb and anastomosis protocol
- **Ring placed 3 cm above the gastro-jejunostomy — the only difference**
- Hiatal hernia repair / cholecystectomy if pre-operatively diagnosed



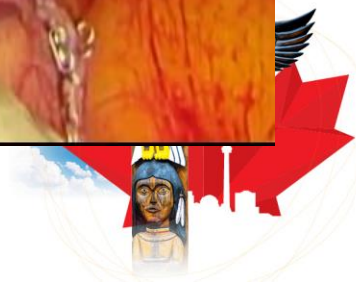
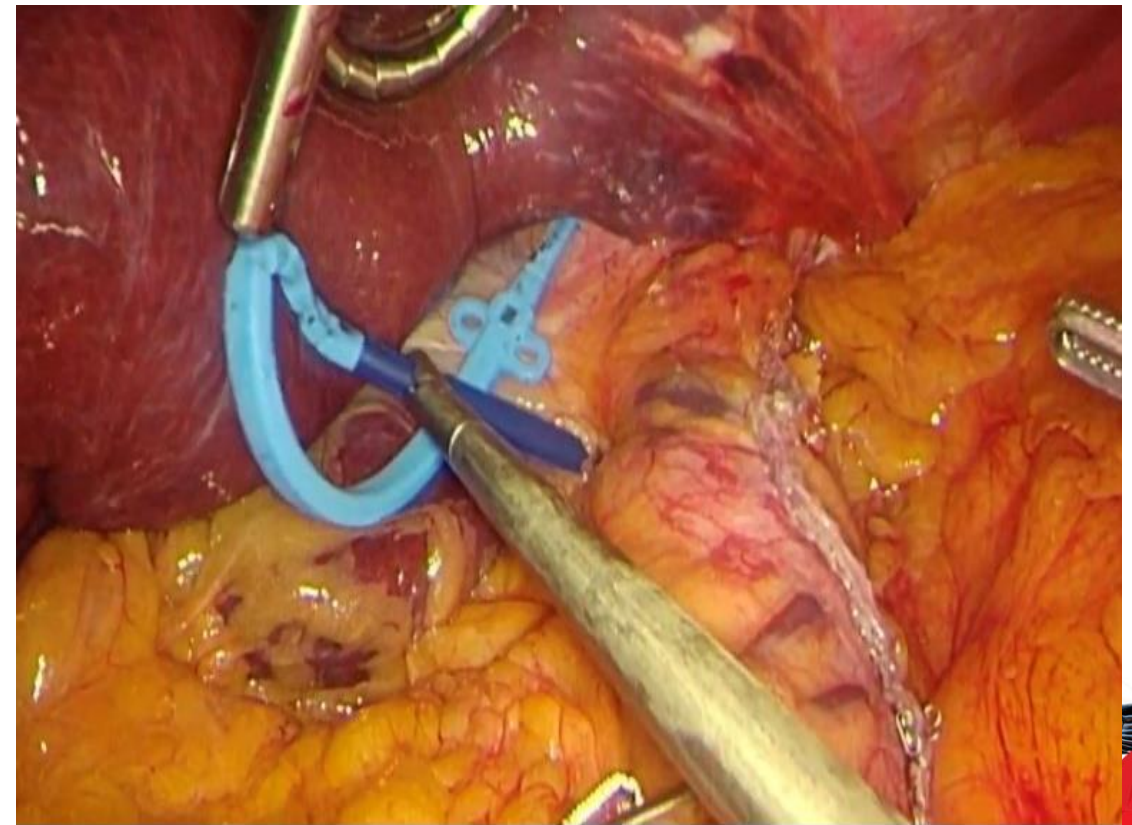
Ring placement: pouch preparation and tunnel

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

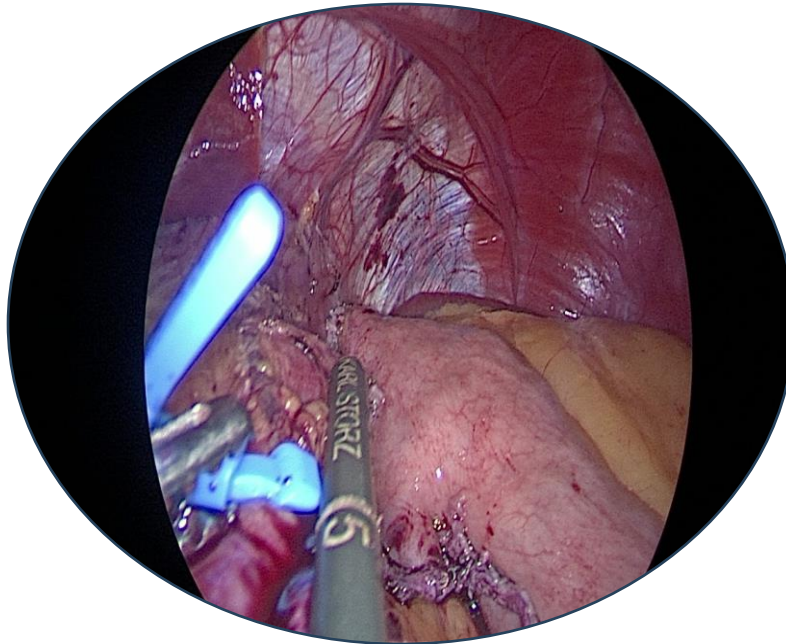


Perigastric tunnel — created close to the gastric wall

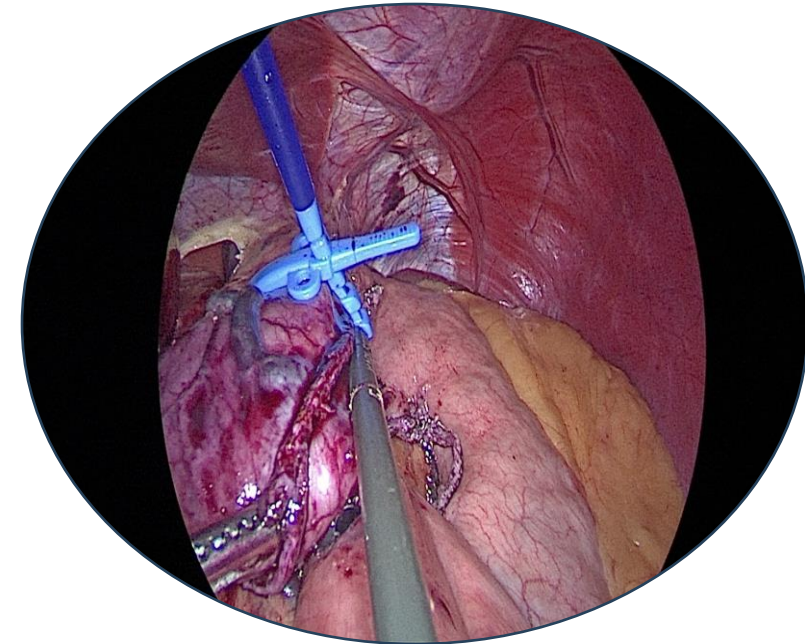


Ring application and fixation

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 it 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



Baseline comparability and operative characteristics

Demographics, obesity-related disease burden, and the operative/perioperative course in both arms

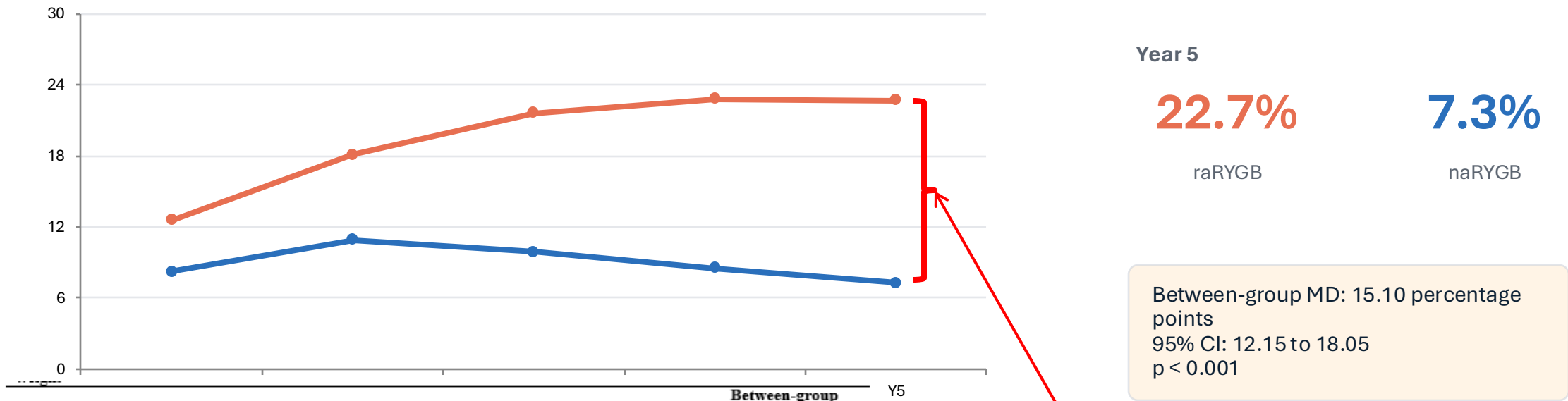
Pre-conversion BMI balanced: 46.0 ± 8.8 vs 45.1 ± 3.7 kg/m²

Obesity-related disease burden and post-SG nadir anthropometrics comparable

Operative time, concomitant procedures and hospital stay similar



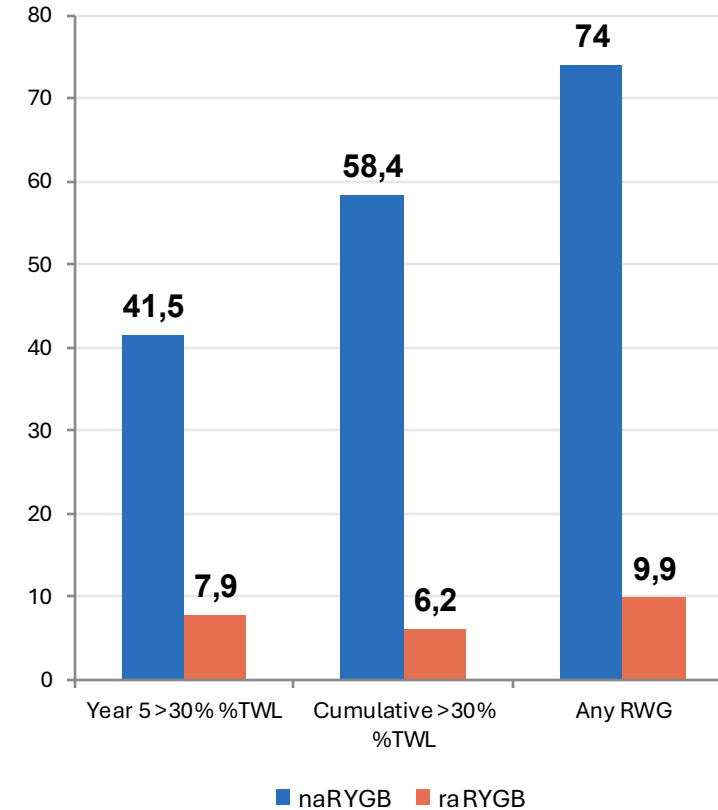
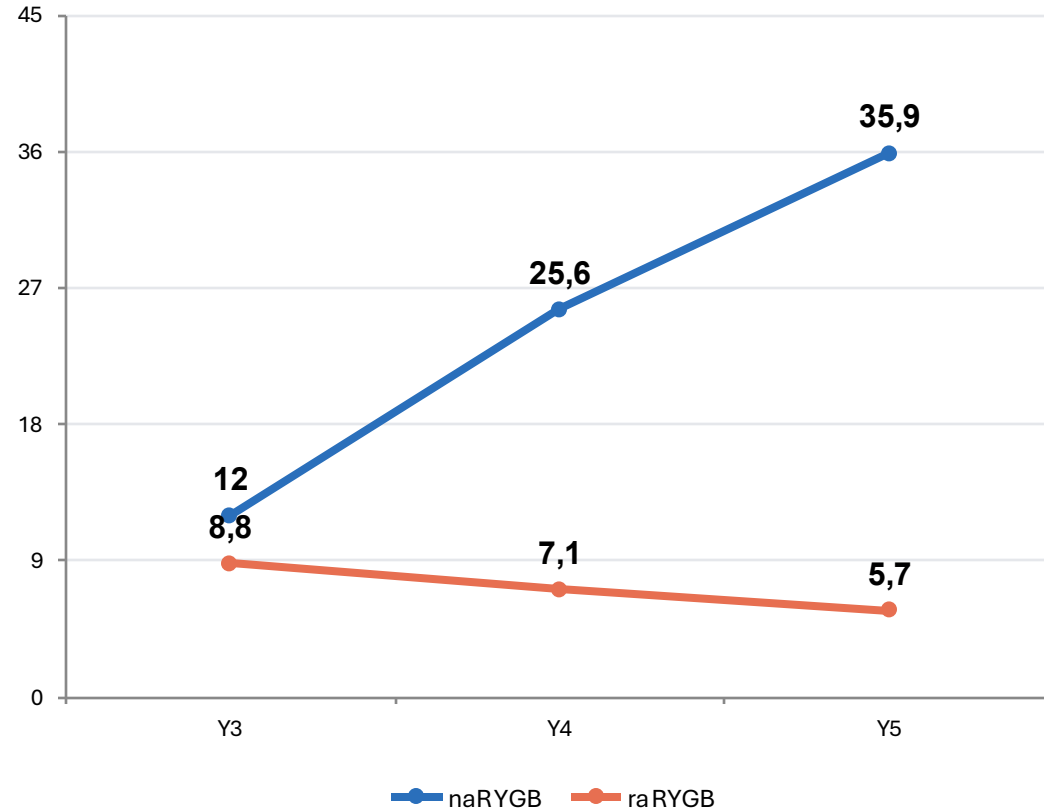
Primary endpoint: five-year %TWL after conversional RYGB



Outcome	Time	naRYGB			raRYGB			Between-group comparison	
		Mean ± SD	MD from reference (95% CI)	P	Mean ± SD	MD from reference (95% CI)	P	MD (95% CI)	P
Percentage total weight loss (%TWL)	Year 1	20.7 ± 7.0	Reference		19.8 ± 6.4	Reference		-0.94 (-2.96 to 1.02)	0.346
	Year 2	22.5 ± 6.7	2.37 (2.18 to 2.55)	<0.001	24.9 ± 9.2	5.07 (4.32 to 5.82)	<0.001	1.76 (-0.61 to 4.13)	0.146
	Year 3	21.5 ± 6.5	1.56 (1.23 to 1.88)	<0.001	28.2 ± 11.7	8.12 (6.79 to 9.45)	<0.001	5.62 (2.82 to 8.43)	<0.001
	Year 4	19.9 ± 6.5	0.29 (-0.17 to 0.76)	0.525	29.3 ± 12.7	9.27 (7.70 to 10.83)	<0.001	8.03 (5.02 to 11.04)	<0.001
	Year 5	18.9 ± 6.5	-0.79 (-1.37 to -0.21)	0.028	29.1 ± 13.0	9.04 (7.43 to 10.66)	<0.001	8.89 (5.84 to 11.95)	<0.001

The difference widened through long-term follow-up.

Recurrent weight gain (RWG)



raRYGB substantially reduced clinically significant post-nadir RWG.

“Recurrent weight gain was defined according to contemporary IFSO terminology as regain of more than 30% of the initial surgical weight loss after nadir weight or worsening of an obesity-related complication after an initial improvement.”

BAROS and food tolerance

BAROS weight-loss component

naRYGB Year 5 median



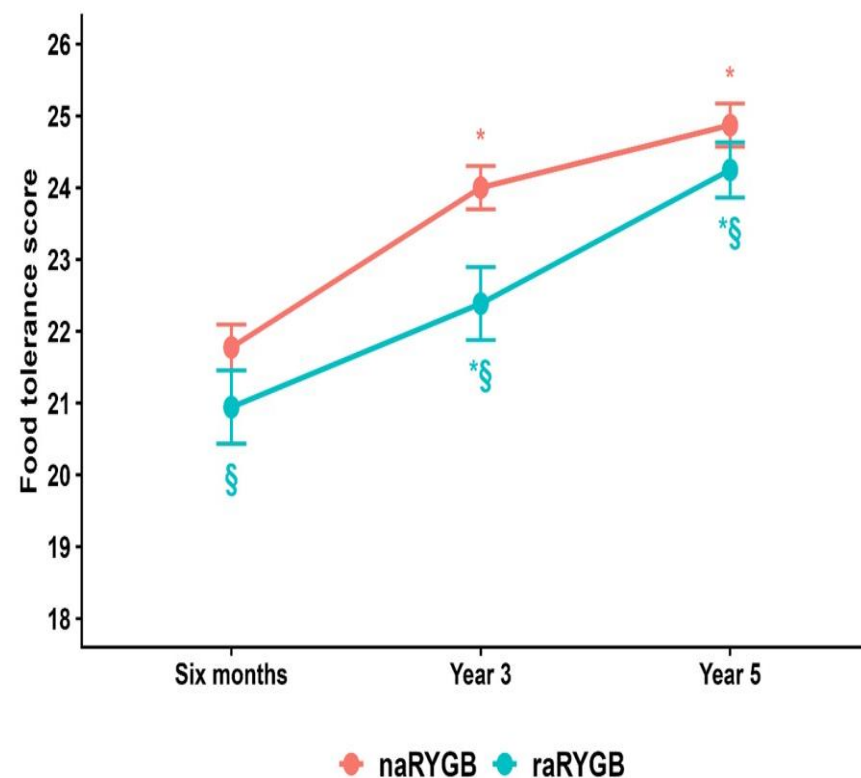
1.00

raRYGB Year 5 median



3.00

Weight-loss score favoured raRYGB at Years 4–5.
Total BAROS did not separate (6.25 vs 6.25).



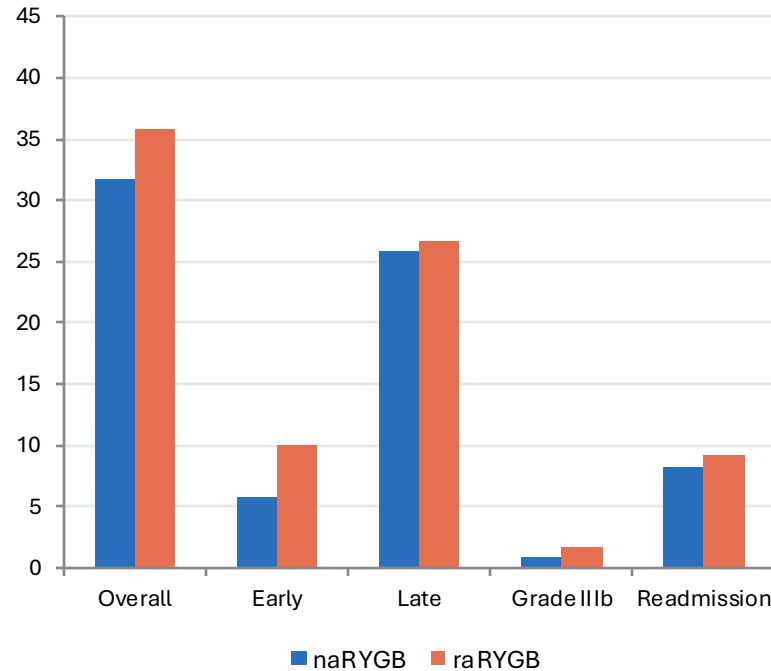
* denotes a significant within-group change relative to 6 months

§ denotes a significant difference between naRYGB and raRYGB at the corresponding time point

Conversional RaRYGB has better weight durability, with a measurable tolerance penalty.



Safety profile: Overall complications



Complications (naRYGB vs raRYGB)

Early 5.8% vs 10.0% ($p = 0.339$)

Late 25.8% vs 26.7% ($p = 1.000$)

Overall 31.7% vs 35.8% ($p = 0.585$)

Ring removed in 4 patients (3.3%), Years 2–5 — no erosion, no slippage, no mortality.



Comparable disease, endoscopic and hormonal outcomes

Secondary domains did not redefine the treatment effect

Obesity-related disease — both arms improved, no between-group difference

GERD and endoscopic findings — low event rates, no separation

Gut hormones, laboratory values and micronutrients — no differences

The between-arm difference is driven by weight outcomes — not by metabolic, endoscopic or hormonal divergence.



Central interpretation of our RCT

raRYGB produced a durable weight-loss advantage after SG-to-RYGB conversion, driven mainly by sustained restriction and reduced post-nadir recurrent weight gain.

- The treatment effect was not limited to early postoperative weight loss.
- Separation between groups widened over time, supporting a durability signal.
- The main clinical value of ring augmentation appears to be prevention of late RWG rather than additional metabolic benefit.



Revisional / Conversional raRYGB in the IFSO Position Statement

- 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



Where the evidence needs to go next

- Longer follow-up — does the ring advantage persist beyond five years?
- Multicentre replication — other populations, other teams, and who benefits most
- Broader endpoints — cost-effectiveness and patient-reported outcomes
- OMMs.

Until then, ring placement at conversion is a reasonable option in selected patients — not a default.



Limitations

- **Not blinded**
- **Device- and technique-specific — this ring, this pouch, this fixation**
- **Five-year horizon; powered for weight loss, not for secondary endpoints**

Interpret as a well-controlled efficacy signal that now requires external replication.



Conclusion

- 1 raRYGB improved five-year weight-loss durability after SG-to-RYGB conversion.
- 2 The most clinically meaningful signal was reduced post-nadir RWG.
- 3 The benefit came with a tolerance trade-off, supporting proper counseling rather than routine use.



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