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1-4 September 2026 | Toronto, Canada

Anatomical Reversal after Bariatric Surgery

Medium- and Long-Term Nutritional, Weight, and Metabolic Outcomes

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TORONTO2026

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

ifso2026.org

Disclosure

There is nothing to disclose

The Paradox of Bariatric Reversal

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Bariatric surgery works by changing anatomy

- Gastric restriction / alteration
- Intestinal diversion
- Altered nutrient flow
- Altered enteroendocrine signaling

↓

Weight loss & metabolic benefit

But sometimes the anatomy becomes the problem

- Severe malnutrition / Excessive weight loss
- Diarrhea / intolerance
- Dumping / post-bariatric hypoglycemia
- Marginal ulcer

↓

Reversal

The anatomical changes that deliver profound health benefits can, in a small subset of patients, lead to life-threatening harm

Plath et al. Obes Surg. 2025 [2]; Rellme et al. Obes Surg. 2025 [7]

What Do We Mean by "Anatomical Reversal"?

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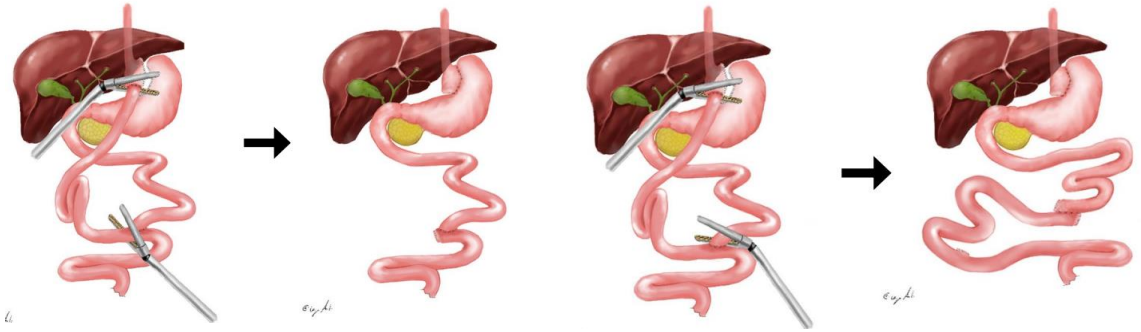
I. Restoration to Normal / Near-normal Anatomy

- RYGB → normal anatomy
- OAGB/MGB → normal anatomy
- Historical JIB → restored intestinal continuity

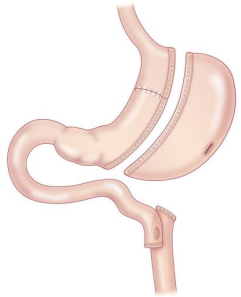
Final state: most bariatric anatomy removed



II. Intestinal De-bypass with Gastric Alteration Preserved

- RYGB → NASG / SG
- OAGB/MGB → SG
- SASI → SG
- SADI-S → continuity restored, SG retained

Final state: bypass removed — sleeve remains



Common-channel lengthening, BPL shortening and other partial revisions are outside the scope of this presentation.

Two Anatomical Endpoints

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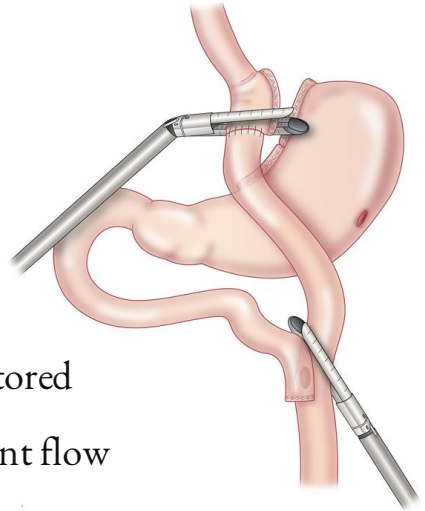
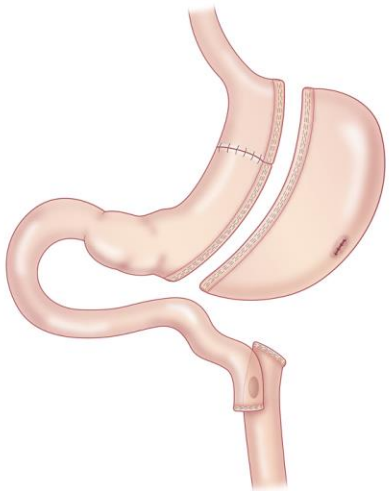
Normal / Near-normal Anatomy



- Gastric continuity restored
- Pylorus back in nutrient flow
- Duodenum re-exposed
- Intestinal bypass removed

vs

Intestinal Continuity + SG



- Intestinal bypass removed
- SG retained
- Foregut continuity restored
- Gastric bariatric physiology partly preserved

Nutrition ? **Weight ?** **Metabolism ?**

Do these two final anatomies produce different medium- and long-term outcomes?

What Evidence Do We Actually Have?

EVIDENCE BY AVAILABLE FOLLOW-UP HORIZON

Early (under 2 y)

Sillén 2026 · Plath 2025 · Ma 2019 · Wafa 2026 · Carter 2016 · Chen 2016 · Wang 2025

Medium (2–5 y)

Rellme 2025 — 2.4 y · Gribsholt 2025 — ~3.4 y

Longer-term (over 5 y)

Arman 2018 — 5.3 y · Dean 1990 — ~6 y

Anderson 1994 — historical · Hamed 2026 — SASI 10-y cohort endpoint

Evidence is still mostly

- Retrospective
- Small-volume
- Heterogeneous
- Different indications
- Different final anatomies
- Poor metabolic reporting

The largest studies are not necessarily the longest studies.

Arman [1]; Rellme [2]; Gribsholt [3]; Hamed [4]; Sillén [8]; Plath [7]; Ma [9]

Part I — Restoration to Normal / Near-normal Anatomy

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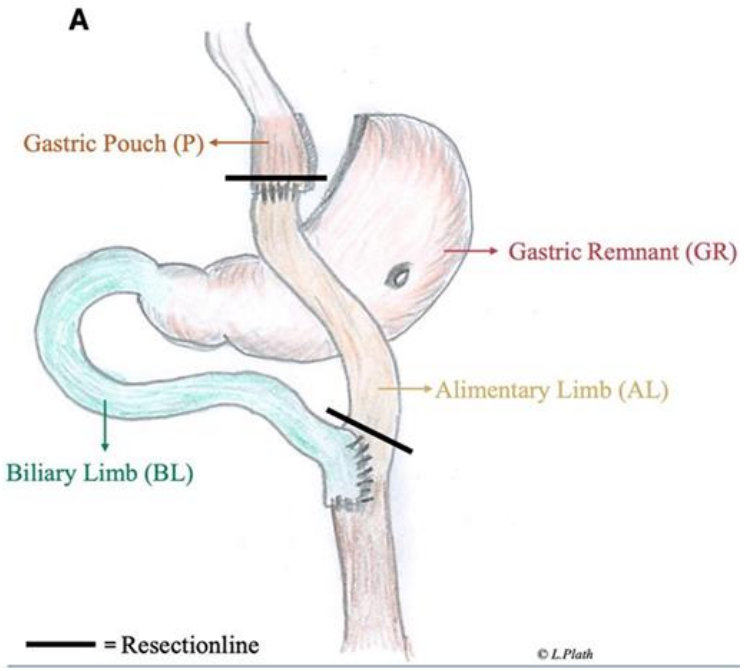
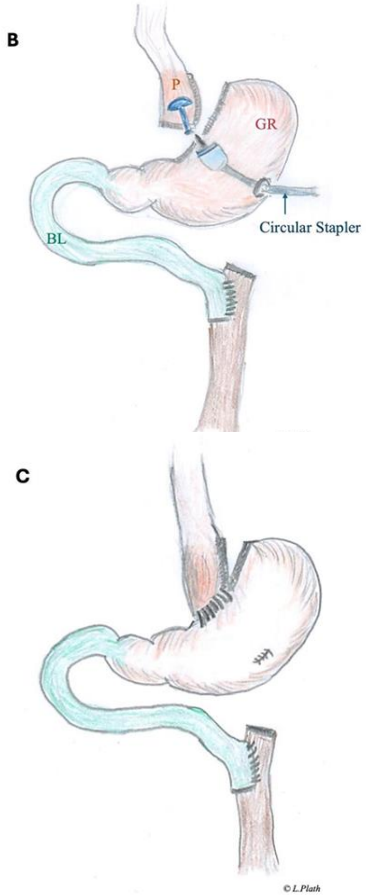
What are we actually restoring?



REVERSAL



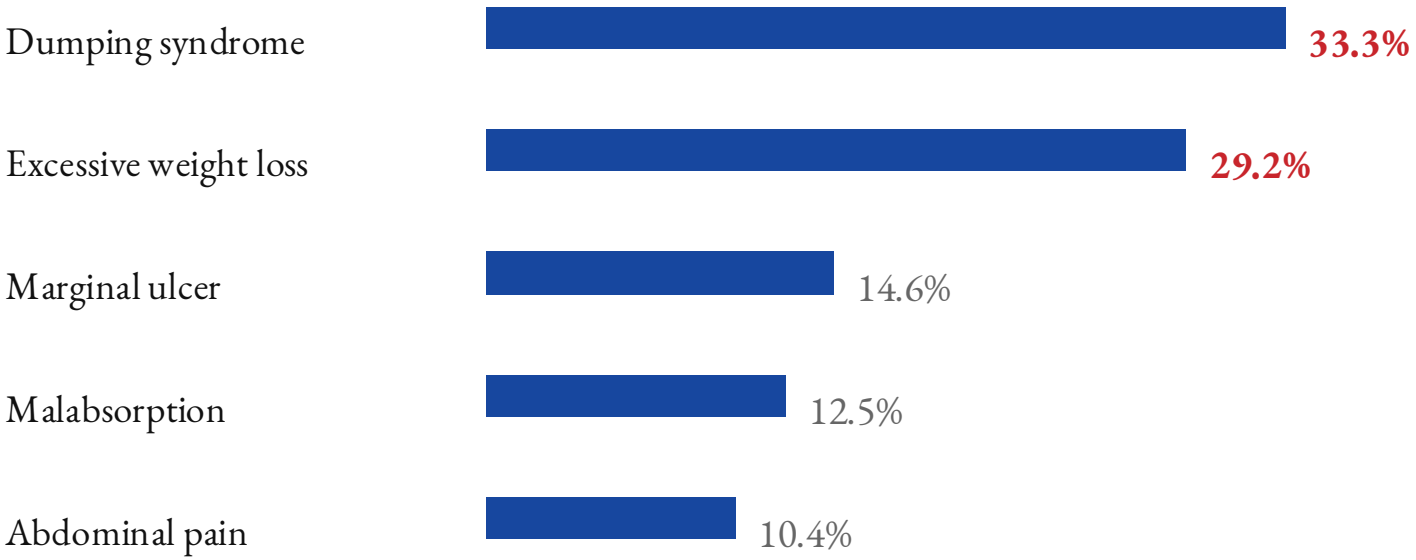
- Gastric continuity
- Pyloric passage
- Duodenal nutrient exposure
- Proximal jejunal continuity

This restores more than absorption.

Gastric emptying, nutrient routing, foregut exposure and enteroendocrine signaling all change.

Who Reaches Complete Reversal?

Plath et al. 2025 — RYGB reversal, n = 48



7 years
Median RYGB → reversal

BMI 23.9
At reversal

50%
Had ≥1 previous bariatric revision

Sillén 2026 — Swedish national cohort, n = 199: reversal after RYGB is rare.

Complete reversal is usually a salvage procedure.

Plath et al. Obes Surg. 2025 [7]; Sillén et al. Ann Surg. 2026 [8]

Does Complete Reversal Actually Work?

Rellme 2025 — n = 70 · mean FU 2.4 y

Defined bypass-related indications (malnutrition / hypoglycemia / defined symptoms)

96%

complete symptom resolution

Abdominal pain

85%

complete or partial improvement — less predictable

Gribsholt 2025 — ~3.4 y

10 / 11

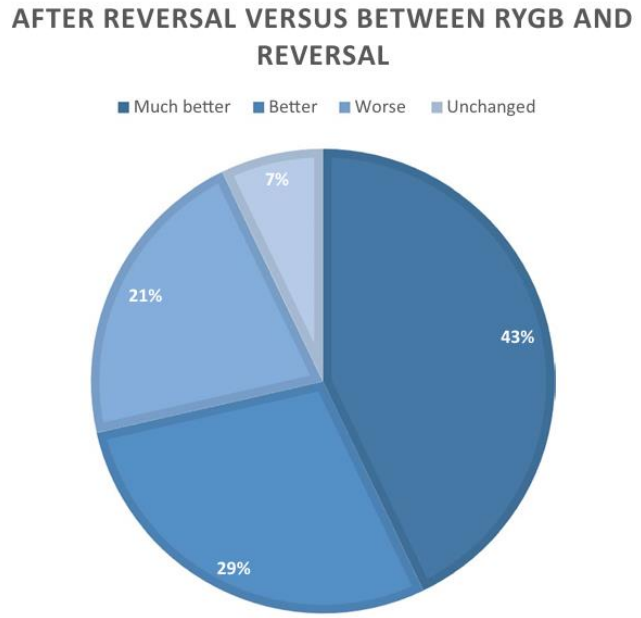
malabsorption resolved

5 / 11

dumping / PBH complete remission

Persisted

abdominal pain remained common



Benefit is more predictable when the indication is clearly linked to bypass physiology.

Rellme et al. [2]; Gribsholt et al. [3]

Nutritional Rescue Is the Most Consistent Benefit

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Wafa 2026 — severe malnutrition subgroup

Albumin

2.16 → 3.84 g/dL

Hemoglobin

9.12 → 12.64 g/dL

1-year evidence only

British Journal of Surgery 1994, 81, 1015–1017

Reversal of jejunoileal bypass in patients with morbid obesity

P. E. ANDERSON, T. R. E. PILKINGTON and J.-C. GAZET

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Jejunoileal bypass for morbid obesity was performed on 182 patients between 1971 and 1982. At 19 years' follow-up 60 (33 per cent) have had to undergo reversal. The compelling reasons for reversal were life-threatening malnutrition, immune complex disease, renal oxalate stones, osteomalacia and severe electrolyte disturbance. All patients gained weight after reversal of the jejunoileal bypass; most gained all the weight they had lost. Thirty-one patients returned to grade III obesity and 14 to grade II.

Twelve patients had an associated vertical gastroplasty; ten regained their previous weight and only two stayed within normal weight. Patients were generally free from bypass-associated symptoms and complications apart from arthralgia and arthritis. This report concludes a series of articles published by the authors on jejunoileal bypass over the past 20 years describing the rise and fall of this surgical procedure.

Since 1974, when the authors' first report[1] on the treatment of gross obesity was published, the results of jejunoileal bypass in a consecutive series of 182 patients have been reviewed. Assessment included not only an examination of the explanation for weight loss and its psychological consequences, but the metabolic effects on liver, bone and colon[2,3]. In 1986, the authors considered that jejunoileal bypass would be completely replaced by the Mason vertical gastric banding procedure[4], although they also examined the value of their modified Scopinaro procedure[5] in 40 patients.

Sixty (33 per cent) of 182 patients who had undergone jejunoileal bypass had received surgical reversal by 1990. These patients were followed up for a minimum of 3 years. The reasons for reversal, mortality, morbidity and final outcome are described.

Patients and methods

Jejunoileal bypass was performed for morbid obesity in 182 patients in the authors' unit between 1971 and 1982. The jejunum was always anastomosed end to side to the ileum; the lengths of jejunum and ileum are given in Table I.

Reversal consisted of reconstituting the normal small bowel anatomy with cholecystectomy in those who had undergone cholecystojejunostomy. In 13 patients a vertical banded gastric partition was performed at reversal. Follow-up of all patients was up to 19 years, with a minimum follow-up of 3 years after reversal. Only three patients were lost to follow-up as they had left the UK and there was no forwarding address.

Body mass index (BMI = weight (kg)/height² (m²)) was used to show the changes in obesity status. The index was calculated at the time of jejunoileal bypass, at the lowest weight, at the time of

Paper accepted 8 November 1993

Table 1 Reversal rate related to length of bowel in circuit after jejunoileal bypass

Length of jejunum : length of ileum*				
Inches	14:4	4:10	7:7	7:7 CH
Centimetres	35:10	10:25	17·5:17·5	17·5:17·5
No. of bypass operations (n = 182)	4	52	80	46
No. of reversal procedures (n = 60)	2‡ (50)	21 (40)	27 (34)	10 (22)

Values in parentheses are percentages. *As measured on antimesenteric border kept in continuity †CJ refers to the cholecystojejunostomy performed between the bypassed blind end of the jejunum and the fundus of the gallbladder. ‡Two patients underwent reversal because of poor weight loss with conversion to gastric partition

Table 2 Reasons for reversal of jejunoileal bypass

	No. of patients
Persistent complications	
Fluid and electrolyte imbalance	21
Metabolic failure	23
Immune complex problems	
Arthropathy	16
Vasculitis	10
Fever	1
Urinary calculi	9
Recurrent bowel obstruction	4
Osteomalacia	3
Postoperative gastrointestinal bleeding	1
Wernicke's encephalopathy	1
Associated reasons	
Patient's request	10
Failure to lose weight	6
Psychological disturbance	6
Anal fissure	3

In most patients there were multiple reasons

Table 3 Complications of reversal of 60 jejunoileal bypass procedures

	No. of patients
Sepsis	9
Incisional hernia	8
Postoperative haemorrhage	1
Wound dehiscence†	1
Prolonged ileus	2
Gastric ulcer*	1
Rectovaginal fistula†	1
Obstructed anastomosis†	1
Pulmonary embolus	2
Strangulated jejunum†	1
Renal failure	1
Death	0

*Related to nylon tape used in banded gastroplasty. †Reoperation was necessary

Long-Term Outcome of Reversal of Small Intestinal Bypass Operations

Philip Dean, MD, Shoba Joshi, MD, Donald L. Kaminski, MD, St. Louis, Missouri

Between 1976 and 1987, 43 patients underwent reversal of jejunoileal bypass operations because of metabolic complications of the operation. Electrolyte imbalance, malnutrition, and diarrhea (16 patients); cirrhosis (9); nephrolithiasis (9); arthritis (7); and pathologic fractures (1) were the primary indications for reconstruction. Many patients had multiple complications of the jejunoileal bypass operation. Twenty-nine patients underwent gastroplasty at the time of reversal and 14 did not. Seventy three ± 5 months after reversal, patients with a gastroplasty weighed significantly less than patients without a gastroplasty. Patients with electrolyte imbalance, malnutrition, and diarrhea were all improved after reconstruction. Two patients with cirrhosis died of liver failure after reconstruction; the distinguishing preoperative characteristic was ascites. Postoperative interval liver biopsies indicated improvement in histologic appearance in four patients. Gastroplasty produced no benefit in alleviation of metabolic complications of jejunoileal bypass operations. Although the survival rate in these patients at last follow-up was 95 percent, 28 percent were incapacitated. Simultaneous gastroplasty performed at the time of reversal significantly decreases body weight when compared with patients undergoing reversal without a gastroplasty.

Jejunoileal bypass operations to treat morbid obesity were frequently performed between the time of the original description of the procedure in 1969 until a moratorium was declared on the performance of this operation in 1980 [1,2]. Although the exact number of such operations performed is not known, published estimates suggest that approximately 25,000 persons underwent this operative procedure in the United States [3].

Although the operation produced satisfactory weight loss, it produced a variety of complications including malabsorption, hyperoxaluria and nephrolithiasis, arthritis, osteomalacia, and cirrhosis [3]. The present legacy associated with this operative procedure relates to the continued need to care for patients with the complex metabolic complications of the procedure and to determine the need for and perform reversal operations. Additionally, if reversal is performed, consideration for the patients' propensity to regain lost weight and redevelop the previously present complications of obesity also becomes important [4].

The purpose of the present study is to evaluate the results of reconstruction of jejunoileal bypass operations on the correction of the metabolic consequences of the procedure.

PATIENTS AND METHODS

Between 1971 and 1978, approximately 800 jejunoileal bypass operations were performed at St. Louis University Hospital [5]. Between 1979 and 1987, 43 patients underwent reconstruction of the jejunoileal bypass, with 40 of the patients having had the original jejunoileal bypass operation performed at this institution and 3 patients having had their original operation performed elsewhere.

The technical aspects of the reconstruction operations varied depending on the type of jejunoileal bypass operation the patient underwent. Patients with an end-to-side or so-called Payne jejunoileal bypass [7] had a single small-bowel anastomosis performed to restore continuity. The ileum to which the jejunum is anastomosed is markedly enlarged, and the anastomosis was disconnected with a linear stapling device without compromising the lumen of the ileum.

In patients with an end-to-end jejunoileal bypass operation, performed as described by Scott et al [6], the proximal end of the distal ileum was anastomosed to the colon to prevent the bypassed bowel from being a blind loop. The colonic anastomosis was found on the ascending, transverse, or sigmoid colon. This end-to-side anastomosis was disconnected with a stapling device while carefully preserving the lumen of the colon. Preoperative colonic mechanical preparation was not performed.

All small intestinal anastomoses were performed with a GIA stapling device in a functional end-to-end fashion

From the Departments of Surgery and Medicine, St. Louis University Medical Center, St. Louis, Missouri.

Requests for reprints should be addressed to Donald L. Kaminski, MD, Department of Surgery, St. Louis University Medical Center, 3635 Vista Avenue at Grand Boulevard, P.O. Box 15250, St. Louis, Missouri 63110-0250.

Presented at the 30th Annual Meeting of the Society for Surgery of the Alimentary Tract, Washington, D.C., May 16–17, 1989.

Pernar 2016

TPN-dependent patients

6 / 6 weaned from TPN

Dean 1990 — long-term JIB anchor

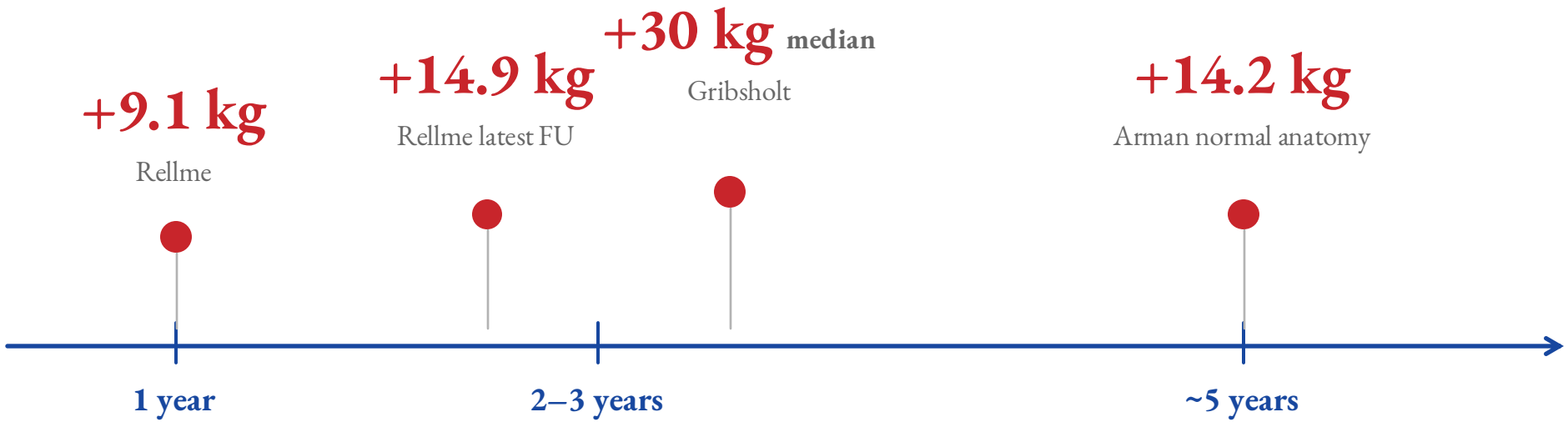
Follow-up 73 ± 5 months

Improved: malnutrition · electrolyte disturbance · diarrhea · nephrolithiasis

When severe malnutrition is anatomy-driven, reversal usually rescues nutrition.

Wafa et al. [12]; Pernar et al. [11]; Dean et al. [5]

Weight Returns — and It Starts Early



Anderson 1994 (JIB): all reversed patients gained weight; many returned to severe obesity

Weight recurrence is an expected physiological consequence — not necessarily failure of reversal.

Cross-study descriptive comparison only — no pooled estimate.

Rellme [2]; Gribsholt [3]; Arman [1]; Anderson [6]

Metabolic Effects — Benefit and Uncertainty

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What reversal can fix

Post-bariatric hypoglycemia — strong causal link to foregut bypass (Campos 2014; Davis 2018)

Dumping syndrome — leading reversal indication; responds when bypass physiology is removed

vs

What reversal may cost

Long-term metabolic recurrence — consequences of losing the bypass are largely unknown

Gribsholt 2025: 2 patients with T2DM recurrence after reversal

How well quantified is each metabolic domain?

We can predict what reversal cures far better than what it may later cost.

Campos et al. [19]; Davis et al. [20]; Gribsholt et al. [3]

Safety — Reversal Is Not a Benign Operation

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Plath 2025 · n = 48

Overall morbidity **50%**

Clavien–Dindo III–IV **16.7%**

Reoperation **10.4%**

Mortality **1 death**

Rellme 2025 · n = 70

VTE **7.1%**

Reoperation **13%**

Ma 2019 · n = 48
single-institution retrospective series

30-day morbidity **29%**

Why the risk is high

- Complex revisional anatomy — multiple anastomoses
- Half had ≥1 previous bariatric revision
- Often malnourished, compromised hosts

Patient selection and counselling must include the operative risk — not only the expected benefit.

Reversal trades a physiological problem for a surgical one — the exchange must be worth it.

Plath et al. [7]; Rellme et al. [2]; Ma et al. [9]

PART II

Intestinal De-bypass with Gastric Alteration Preserved

If we must remove the intestinal bypass — should we preserve a gastric bariatric component?

De-bypass restores intestinal continuity → rescues nutrition

+

Preserved sleeve keeps restriction → may limit weight regain

=

De-bypass + sleeve — a middle path?

The Bridge Study — Arman 2018

Longest structured FU — 5.3 y

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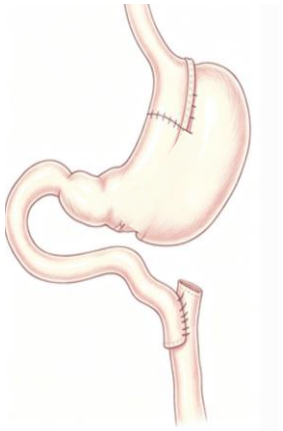
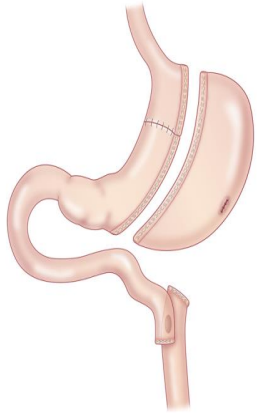
RYGB → Normal anatomy (NA) 13

+14.2 kg

± 13.7 kg · at 5.3 years



VS



RYGB → Near-normal + SG (NASG) 12

−4.8 kg

weight maintained / further loss

Weight change at 5.3 y (kg)

Small | Retrospective | Non-randomized — selection, not proven causality; more leaks in NASG.

One cohort, two endpoints — signals, not conclusions.

Arman et al. Obes Surg. 2018 [1]

RYGB → Sleeve Gastrectomy — Feasible, But Short Follow-up

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Carter 2016 · n = 12

11 / 12

symptom resolution

Original article

Conversion from gastric bypass to sleeve gastrectomy for complications of gastric bypass

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Received June 2, 2015; accepted July 1, 2015

Abstract

Background: Complications after gastric bypass (RYGB) are well documented. Reversal of RYGB is indicated in select cases but can lead to weight gain. Conversion from RYGB to sleeve gastrectomy (SG) has been proposed for correction of complications of RYGB without associated weight gain. However, little is known about outcomes after this procedure.
Objectives: To examine outcomes after conversion from RYGB to SG.
Setting: University hospital.
Methods: A retrospective study of patients who underwent RYGB to SG conversion was undertaken.
Results: Twelve patients underwent RYGB to SG conversion for refractory marginal ulceration, stricture, dumping, gastrogastric fistula, hypoglycemia, and failed weight loss. No deaths occurred. Four patients experienced 7 major complications, including portal vein thrombosis, bleeding, pancreatic leak, pulmonary embolus, seroma, anastomotic leak, and stricture. Two required reoperation, and 6 were readmitted within 30 days. Four required nasoenteric feeding postoperatively because of prolonged nausea. The complication of RYGB resolved in 11 of 12 patients. At 14.7 months, change in body mass index for all patients was a decrease of 2.2 kg/m^2. In 5 patients with morbid obesity at conversion, the change in body mass index was a decrease of 6.4 kg/m^2 at 19 months.
Conclusions: Laparoscopic conversion from RYGB to SG is successful in resolving certain complications of RYGB and does not result in short-term weight gain. However, conversion has a high rate of major complications as well as a high rate of readmission and need for supplemental nutrition. Although conversion to SG may be appropriate in carefully-selected patients, other options for patients with severe chronic complications after RYGB should be considered. (Surg Obes Relat Dis 2016;12:572–576.) © 2016 American Society for Metabolic and Bariatric Surgery. All rights reserved.

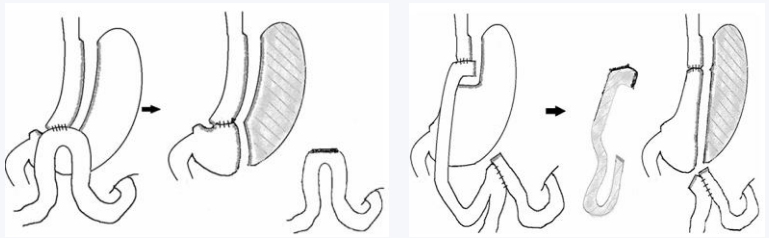
BMI change **−2.2 kg/m²**

patients experienced major complications **4 / 12**

Chen 2016 · n = 49

8.1%

major complications



49 gastric bypass → SG conversions; only 7 were RYGB; technically feasible in experienced hands

⚠ BUT FOLLOW-UP WAS SHORT

Feasibility and safety: established. Long-term weight and metabolism: unknown.

Carter et al. [15]; Chen et al. [16]

OAGB / MGB — Where Do Reversed Patients End Up?

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Kermansaravi 2021 — systematic review

14
studies

119
reversals

~1%
of OAGB patients

Leading indication: protein-energy malnutrition / hypoalbuminemia

Overall complication rate after reversal: **~10.9%**

23.6 months = OAGB → reversal interval, not post-reversal FU

Bandlamudi 2023 — revisional strategies for severe malnutrition

Severe malnutrition after OAGB

- **126** (28.2%) → normal anatomy
- **46** (10.3%) → sleeve gastrectomy
- **41** (9.2%) → RYGB

For severe malnutrition after OAGB, different revisional endpoints are used—practice has not converged.

The sleeve-preserving option already exists in OAGB practice — without comparative evidence.

Kermansaravi et al. [13]; Bandlamudi et al. [14]

SASI → Sleeve — Nutrition Rescued, Weight Effect Lost

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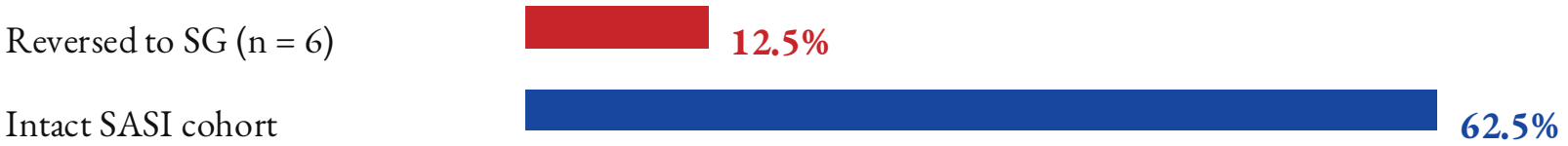
Hamed 2026 — SASI bypass cohort, 10-y endpoint from index operation

15
60% malnutrition rate
(4 PEM · 8 IDA· 5 diarrhea/steatorrhea)

6/15 = 40%
reversed to SG · median 18 months

6 / 6
full nutritional recovery after reversal

%EWL at cohort endpoint



All 6 reversed patients returned to **BMI ≥ 35**

Endpoint measured from **index SASI operation** — not 10 years after reversal.

The sleeve alone did not maintain the weight effect of the intact SASI anatomy.

Hamed et al. 2026 [4]

Recent Evidence — Feasibility, Not Durability

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Wang 2025

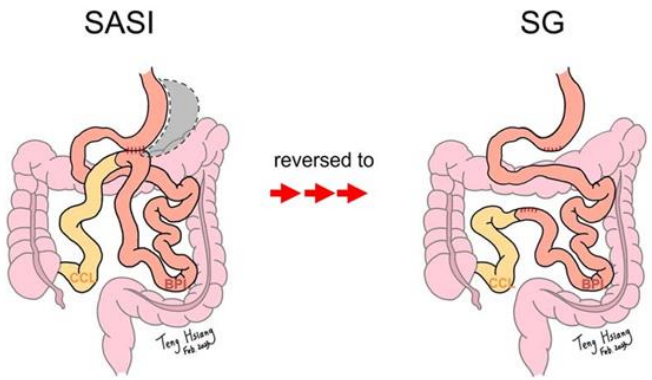
SASI → SG

n = 3— Technical feasibility demonstrated; malabsorption and nutritional problems improved.No meaningful long-term outcome data.

Andraos 2025

6 patients underwent intestinal reversal

Albumin normalized by 3 months across the reoperated cohortAbstract-level evidence; no long-term post-reversal outcomes



These studies demonstrate feasibility—not long-term efficacy.

Wang et al. 2025 [17]; Andraos et al. 2025 [18]

A CASE FROM OUR CENTER

When Bariatric Anatomy Became the Problem

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Patient & initial surgery

35 y ♀ · 93.5 kg · BMI 36.5

Metabolic syndrome · fatty liver · dyslipidemia · target 55 kg

Dec 2022 —SASI

Gastro-ileal anastomosis 260 cm from ICV

Early complications

· Recurrent vomiting

· Cramping abdominal pain

· Recurrent bowel obstruction

POD 33 — adhesiolysis + revision

SASI → BTB

Progressive deterioration

· Poor oral intake · edema

· Numbness, weakness

· Hypoproteinemia

· PN + EN + jejunal feeding

48 kg · BMI 18.75

at final admission, Nov 2023

Weight trajectory (kg)

When diversion exceeds nutritional tolerance, the anatomy itself becomes the source of harm.

A CASE FROM OUR CENTER

Reversal to Sleeve — Nutrition Rescued, Weight Returned

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Before reversal — Nov 2023

48 kg · BMI 18.75

Hb **70** g/L · Alb **29.8** g/L

TP **47.7** g/L

Severe wasting · hair thinning · persistent GI intolerance

Definitive revision

SASI → BTB

→ SG alone

Both anastomoses dismantled — complete intestinal de-bypass

After reversal — 4 months

Alb 29.8 → **42.8** g/L

TP 47.7 → **70.6** g/L

Hb 70 → **127** g/L

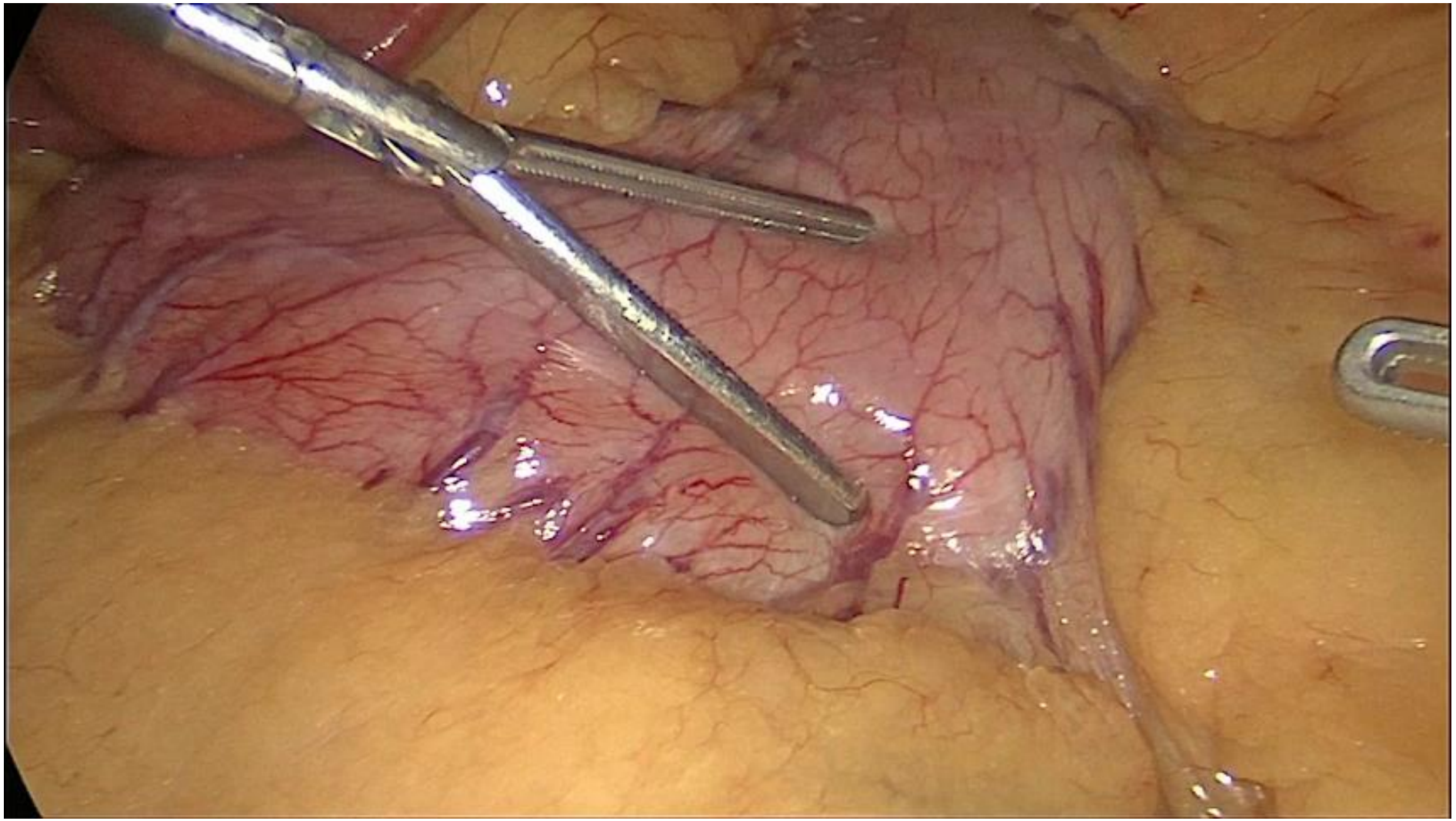
Weight 48 → **73 kg**

Oral intake restored · protein normalized · functional recovery

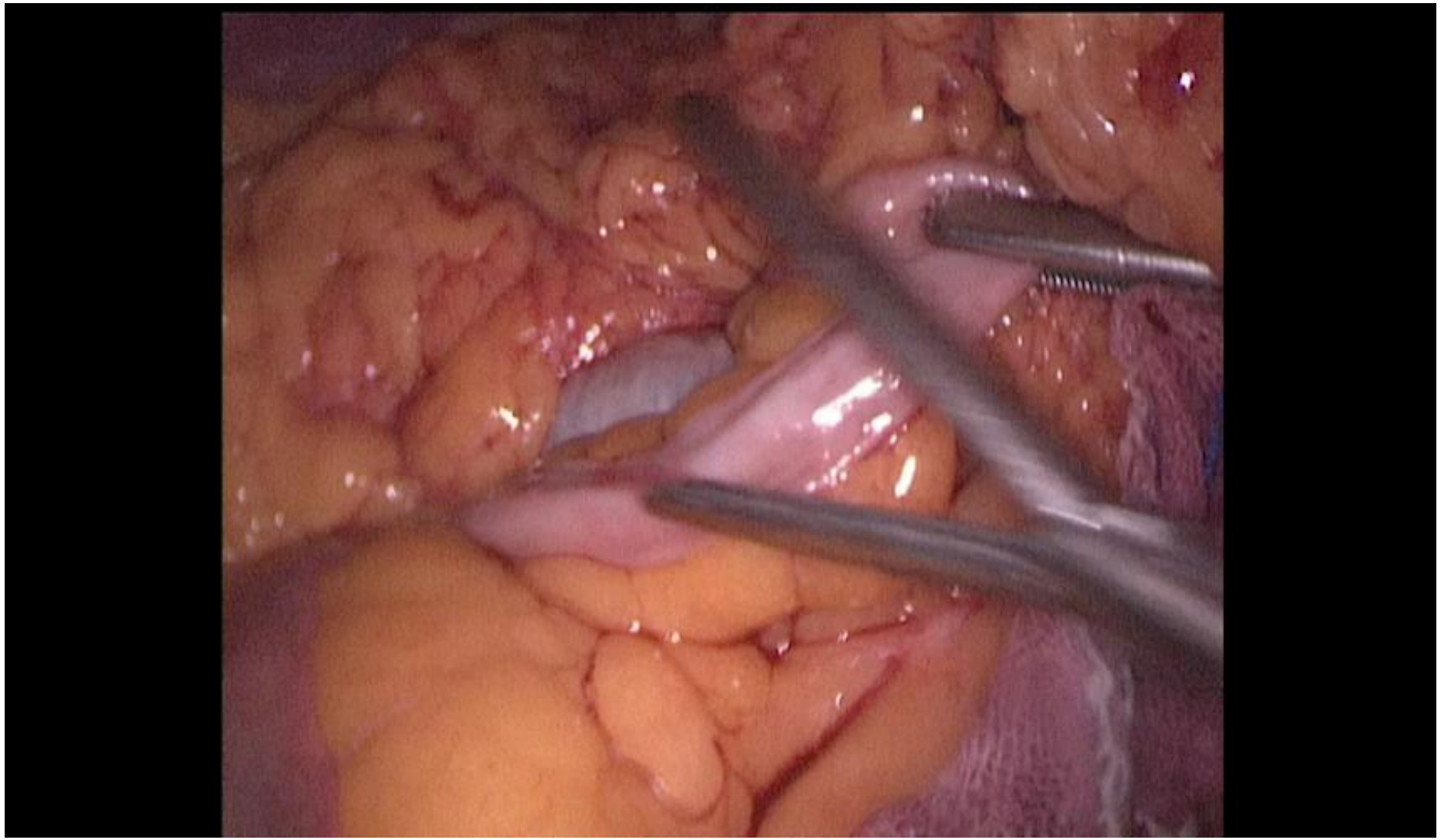
Long-term weight trajectory (kg)

Malnutrition rescued — **weight recurrence followed**: an expected consequence of removing diversion, not necessarily failure.

Video 1. Primary SASI



Video 2. Revisional Surgery: SASI to BTB



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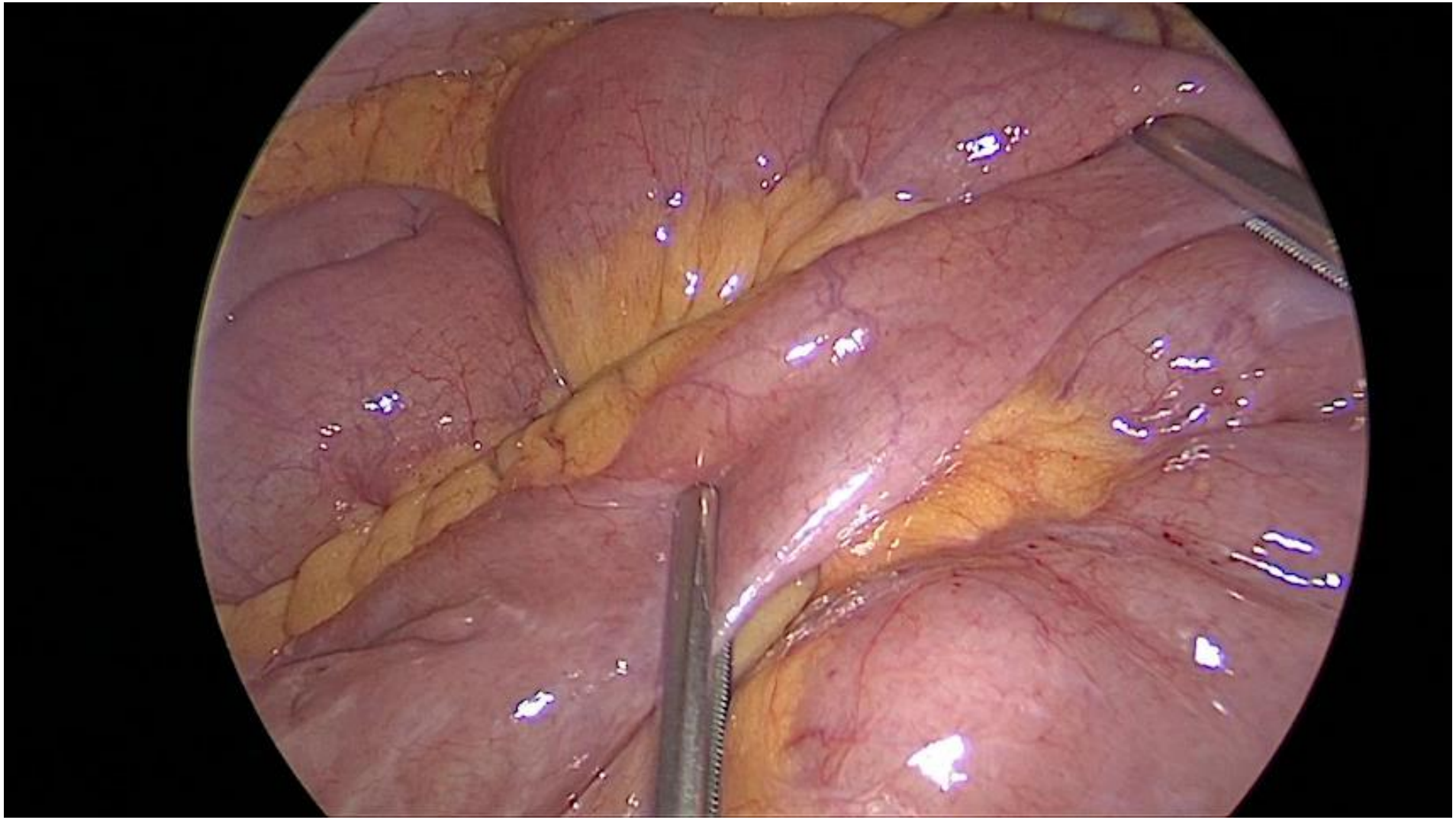
Video 3. Complete De-bypass to Sleeve Gastrectomy



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Is the Sleeve Enough?

Probably only partly.

Gastric component
sleeve-related effects

+

Intestinal nutrient routing

+

Enteroendocrine effects

= Integrated bariatric effect

De-bypass + SG preserves the gastric component, while removing much of the intestinal-routing effect and altering enteroendocrine signaling.

SASI evidence: the sleeve alone did not fully preserve the long-term weight effect.

For a malnourished patient, trading some weight effect for nutritional rescue may still be the right exchange.

Hamed et al. [4]; Arman et al. [1]

Two Endpoints — Two Trade-offs

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Endpoint I — Normal anatomy

+ Maximal nutritional rescue
+ Most predictable symptom relief

– Most procedure-specific bariatric effects are removed
– Substantial weight recurrence is common (+9 to +30 kg across cohorts)

Evidence: several cohorts, FU to 5.3 y (Arman)

Endpoint II — Sleeve preserved

+ Nutritional rescue demonstrated
+ Gastric bariatric component retained (Arman −4.8 kg)

– SASI: substantial long-term weight recurrence (%EWL 12.5%)
– Evidence thin — feasibility level

Evidence: small series, mostly short-term

No robust head-to-head evidence

The optimal final anatomy remains unknown.

Arman [1]; Rellme [2]; Gribsholt [3]; Hamed [4]

Choosing the Final Anatomy — and What We Take Home

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Option A — Full restoration, when...

· Nutritional rescue is the overriding goal

· Recurrent symptoms despite lesser revisions

Option B — Preserve the sleeve, when...

· Weight control still matters to the patient

· A usable gastric remnant / sleeve can safely remain

No evidence-based selection algorithm currently exists.

Take-home messages

1. Reversal is a salvage procedure — with real risk.
2. Nutritional rescue is the most consistent benefit.
3. After full restoration, weight regain is expected.
4. Sleeve preservation: promising — but unproven.

The goal of anatomical reversal should not be merely to normalize anatomy. It should be to **rescue nutritional health while minimizing the loss of effective bariatric physiology**.

When reversal becomes necessary — what should the final anatomy be?

Master Evidence Table

Study	Design	n	Follow-up	Key finding
Arman 2018 [1]	Retrospective, 2 endpoints	25	5.3 y	NA +14.2 kg vs NASG −4.8 kg (NS in NASG)
Rellme 2025 [2]	Cohort	70	2.4 y	96% resolution in defined indications; +9.1 → +14.9 kg
Gribsholt 2025 [3]	Questionnaire cohort	14 respondents	~3.4 y	Malabsorption improved; PBH/dumping 5/11 complete remission; +30 kg median
Hamed 2026 [4]	SASI cohort	95 total; Group 1 n=15; reversal n=6	10 y from index SASI*	Reversal 6/15; %EWL 12.5% vs 62.5%
Dean 1990 [5]	JIB reversal series	43	73±5 mo	Durable nutritional improvement
Anderson 1994 [6]	JIB reversal series	60 reversed	≥3 y post-reversal	Universal weight regain
Plath 2025 [7]	Multicenter	48	up to 1 y	Morbidity 50%; CD III–IV 16.7%
Sillén 2026 [8]	Nationwide cohort	199	early / 1-y outcome	Rare (~0.3%); symptom and safety outcomes reported
Ma 2019 [9]	Single-institution retrospective	48	mainly early	30-day morbidity 29%

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