Biliary reflux after OAGB and GERD after LRYGB

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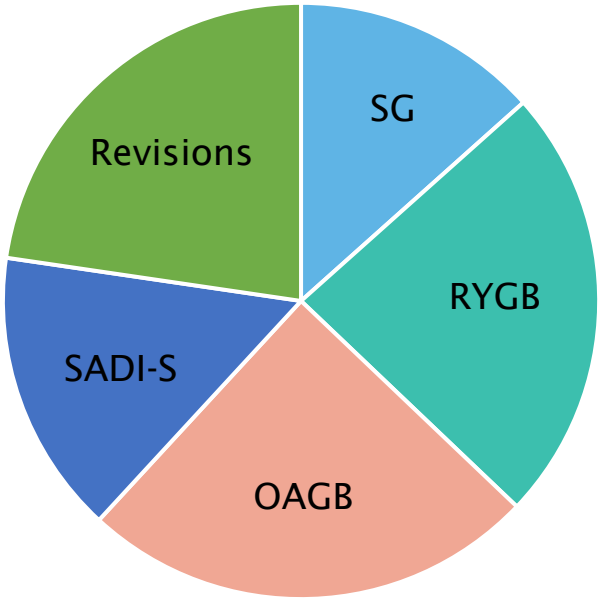
President IFSO 2023/24

Past President IFSO-EC 2018-2021

Disclosures

Medtronic – Engineering the extraordinary	Educational Grant Speaker Fees
ETHICON – Shaping the future of surgery	Educational Grant
OLYMPUS	Educational Grant Speaker Fees
Lilly	Advisory Board
novo nordisk®	Advisory Board Educational Grant

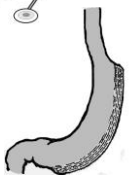
Case-Mix



Gastric Banding	0%
Sleeve Gastrectomy	13%
RYGB	**23%**
OAGB	**24%**
SADI-S	18%
Revisions	22%

Evolution of bariatric-metabolic surgery at our institution

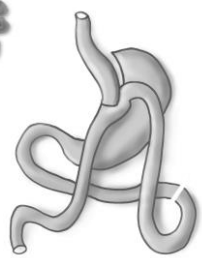
1996 lap. Gastric Banding



2002 lap. Sleeve Gastrectomy

2003 lap. Y-Roux Gastric Bypass

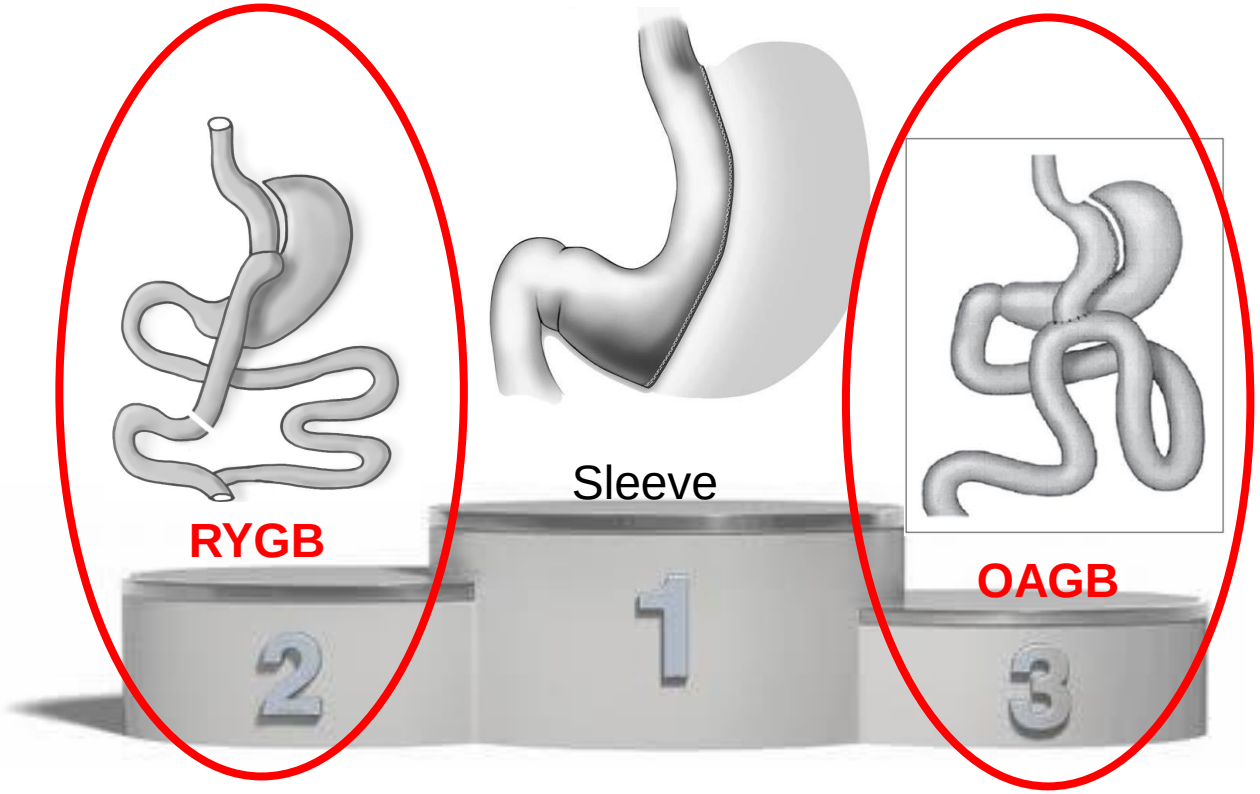
2009 lap. BPD



2010 lap. OAGB

2016 SADI-S

Most Common bariatric procedures worldwide:



Gastric Bypass – Variants

Short Limb Gastric Bypass

Standard Gastric Bypass

Long Limb Y-Roux Gastric Bypass

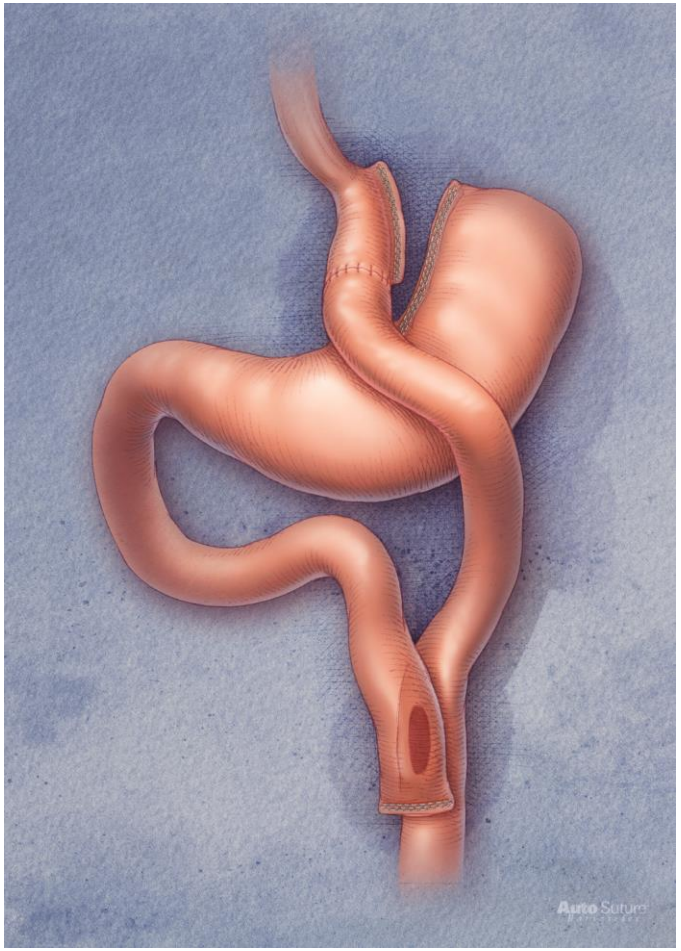
Very Long Limb Gastric Bypass

Distal Very Long Roux Limb Gastric Bypass

Distal Gastric Bypass

Banded Gastric Bypass

One Anastomosis Gastric Bypass (OAGB)



Mini-Gastric Bypass:

Robert Rutledge, MD, FACS
The Center for Laparoscopic Obesity Surgery, Durham, NC,

The Mini-Gastric Bypass: Experience with the First 1,274 Cases

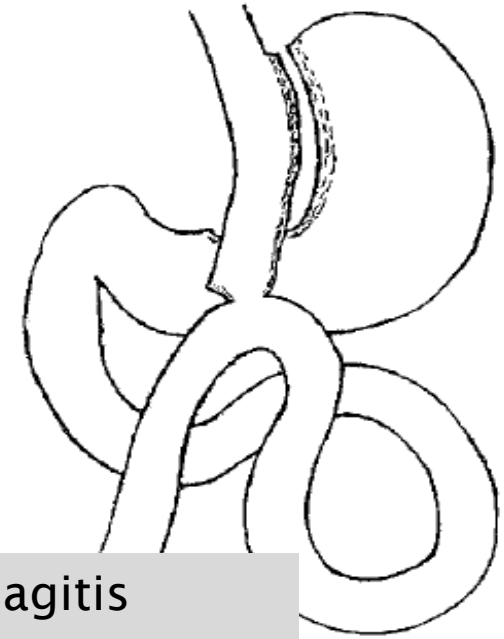
Robert Rutledge, MD, FACS
The Center for Laparoscopic Obesity Surgery, Durham, NC,

First report

Prospective consecutive case series
89% women
Follow-up: 89%

Mean EWL (mean BMI: 47 kg/m^2)

- 1 mo: 20%
- 6 mo: 51%
- 12 mo: 68%
- 24 mo: 77%



app.200cm

6 cases of esophagitis
2% ulcer
77% complete resolution of preop GERD

Obesity Surgery ***11***, 2001: 276-280

Original article

Surgical revision of loop ("mini") gastric bypass procedure: multicenter review of complications and conversions to Roux-en-Y gastric bypass

William H. Johnson, M.D.[a], Adolfo Z. Fernanadez, M.D.[b], Timothy M. Farrell, M.D.[c], Kenneth G. MacDonald, M.D.[d], John P. Grant, M.D.[a], Ross L. McMahon, M.D.[a], Aurora D. Pryor, M.D.[a], Luke G. Wolfe, M.S.[e], Eric J. DeMaria, M.D.[a,e,*]

[a]*Department of Surgery, Duke University Medial Center, Durham, North Carolina*
[b]*Department of Surgery, Wake Forest University Baptist Medical Center, Winston-Salem, North Carolina*
[c]*Department of Surgery, University of North Carolina Health Care System, Chapel Hill, North Carolina*
[d]*Department of Surgery, East Carolina University School of Medicine, Greenville, North Carolina*
[e]*Department of Surgery, Virginia Commonwealth University Health System, Richmond, Virginia*

Received June 12, 2006; revised September 21, 2006; accepted September 28, 2006

5 medical centers

32 patients with complications

3 leaks
20 bile reflux
5 marginal ulcers
8 malnutrition
2 weight regain

Johnson et al, SOARD 2015

THE LANCET

ARTICLES | VOLUME 393, ISSUE 10178, P1299-1309, MARCH 30, 2019

Efficacy and safety of one anastomosis gastric bypass versus Roux-en-Y gastric bypass for obesity (YOMEGA): a multicentre, randomised, open-label, non-inferiority trial

Prof Maud Robert, MD • Philippe Espalieu, MD • Elise Pelascini, MD • Prof Robert Caiazzo, MD • Adrien Sterkers, MD • Lita Khamphommala, MD • et al. Show all authors

- 2 years: %EBMIL **87.9%** OAGB and **85.8%** RYGB
- **21.4%** **severe** **nutritional complications** OAGB vs. **none** RYGB (p=0.0034).
- **16%** OAGB **bile exposure** in the stomach at 2 years
- **Oesophagitis** (endoscopy): OAGB 10% vs. RYGB 3%

The Lancet Diabetes & Endocrinology
Volume 12, Issue 4, April 2024, Pages 267-276

Articles

Efficacy and safety of one anastomosis gastric bypass versus Roux-en-Y gastric bypass at 5 years (YOMEGA): a prospective, open-label, non-inferiority, randomised extension study

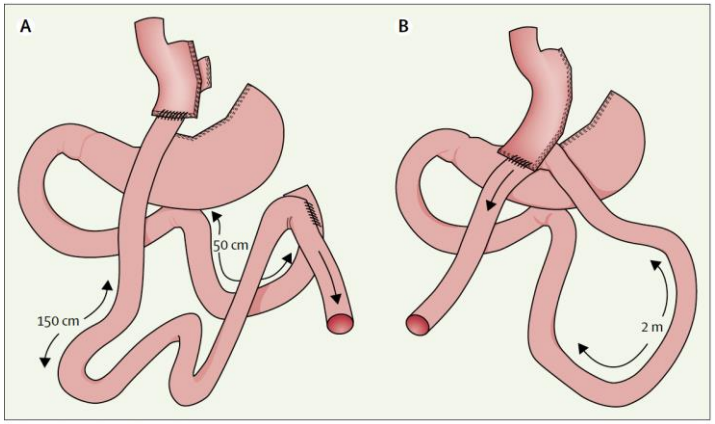


Figure 1: Roux-en-Y gastric bypass (A) and one anastomosis gastric bypass (B) surgical procedures

YOMEGA 5 years

Weight loss, DM remission, Nutritional status: no difference

„The **high rate of clinical gastro-oesophageal reflux disease after OAGB (41%)** raises questions about its long-term consequences, which need to be further investigated."

Volume 12, Issue 4, **April 2024**, Pages 267-276

OAGB: Need for revisional surgery

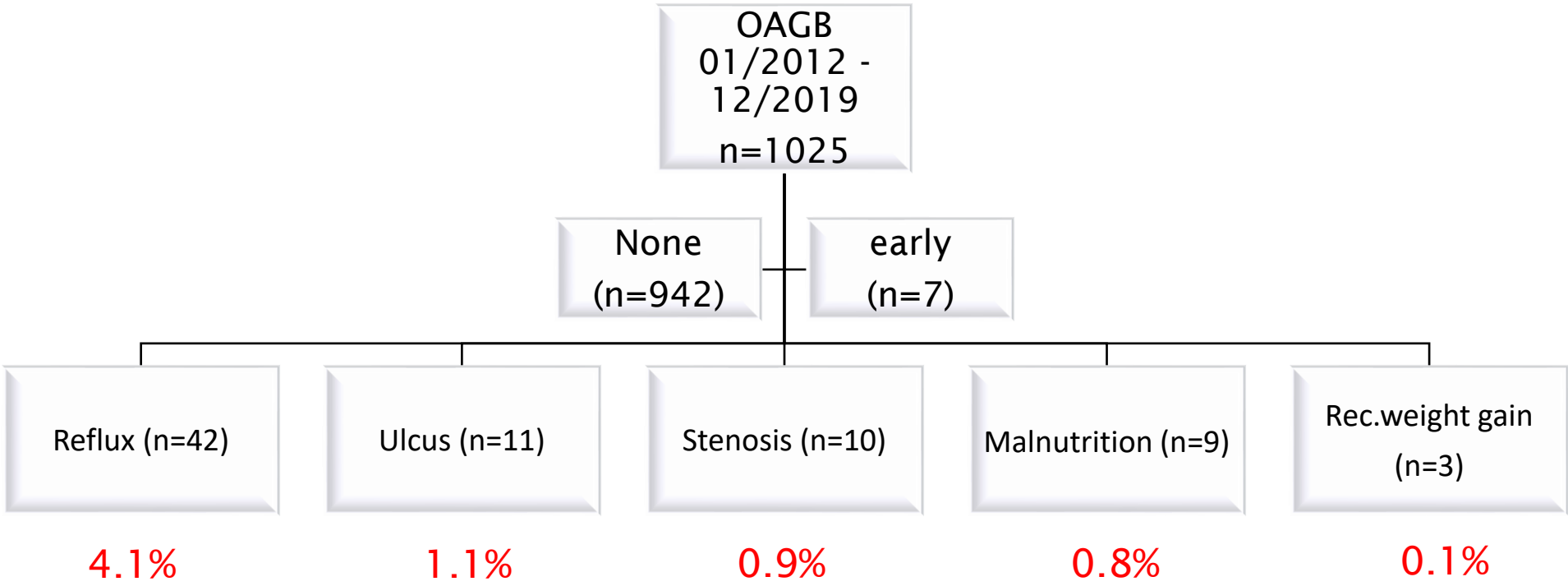
The Vienna experience

1025 OAGB procedures from 2012 to 2019: 82 conversions to RYBG

- **42 bile reflux. (=4.1%)**
- 11 marginal ulcer
- 10 anastomotic stenosis
- 9 malnutrion
- 3 weight regain

Jedamzik et al, SOARD 2022

OAGB – What and how to revise?



In total 7% revision rate

Jedamzik et al., SOARD 2022

Obesity Surgery (2020) 30:4206–4217
https://doi.org/10.1007/s11695-020-04775-y

ORIGINAL CONTRIBUTIONS

One Anastomosis Gastric Bypass with a Biliopancreatic Limb of 150 cm: Weight Loss, Nutritional Outcomes, Endoscopic Results, and Quality of Life at 8-Year Follow-Up

Arnaud Liagre[1] · Tarek Debs[2] · Radwan Kassir[3] · Alain Ledit[4] · Gildas Juglard[1] · Mael Chalret du Rieu[1] · Andrea Lazzati[5] · Francesco Martini[1] · Niccolo Petrucciani[2,6]

Published online: 20 June 2020

Procedure	*N* (%)
Cholecystectomy	11 (9.5%)
Conversion to RYGB	7 (7.6%)
Explorative laparoscopy*	2 (1.7%)
Suture of perforated marginal ulcer	1 (0.8%)
Correction of internal hernia	1 (0.8%)
Abdominal wall surgery	1 (0.8%)

* In 6 cases for intractable reflux, in 1 case for chronic diarrhea

Data are presented as absolute number (percentage)

RYGB Roux-en-Y gastric bypass

Liagre et al., Obes Surg 2020

Functional testing in OAGB

Surgical Endoscopy (2023) 37:3832–3841
https://doi.org/10.1007/s00464-022-09857-9

ORIGINAL ARTICLE

Esophageal function and non-acid reflux evaluated by impedance-24 h-pH-metry, high-resolution manometry, and gastroscopy after one-anastomosis gastric bypass—outcomes of a prospective mid-term study

D. M. Felsenreich[1] · M. L. Zach[1] · N. Vock[1] · J. Jedamzik[1] · J. Eichelter[1] · M. Mairinger[1] · L. Gensthaler[1] · L. Nixdorf[1] · P. Richwien[1] · C. Bichler[1] · I. Kristo[1] · F. B. Langer[1] · G. Prager[1]

24h-pH-metry:

All patients

	Basis OAGB ($n=21$)	Follow-up ($n=21$)	p-value
Manometry			
LESP (mmHg) (10-35 mmHg)	25.5 ± 10.7	28.0 ± 15.6	0.576
Time liquid bolus (s) (< 12 s)	7.2 ± 1.8	4.7 ± 2.2	**0.001**
IRP (mmHg) (< 15 mmHg)	13.6 ± 4.5	11.5 ± 5.8	0.244
DCI (mmHg-cm-s) (450—8000 mmHg-cm-s)	2546.6 ± 1929.5	1410.7 ± 923.9	**0.036**
Impedance-24 h-pH-metry			
Acid exposure time (% of 24 h) (normal < 4.2%)	4.1 ± 3.9	1.2 ± 1.2	**0.004**
Total number of refluxes (normal < 40)	52.1 ± 20.8	58.2 ± 32.1	0.479
Number non-acid refluxes	24.0 ± 15.2	48.0 ± 29.4	**0.003**
Number acid refluxes	28.1 ± 19.4	10.2 ± 8.7	**0.001**
DeMeester score (normal 14.72)	17.5 ± 15.7	7.5 ± 8.9	**0.017**

OAGB one-anastomosis gastric bypass; *HRM* high-resolution manometry; *LESP* lower esophageal sphincter pressure; *IRP* integrated relaxation pressure; *DCI* distal contractile integral; *s* seconds

Felsenreich D.M. et al., Surg Endo 2023

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Felsenreich D.M. et al., Surg Endo 2023

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Felsenreich D.M. et al., Surg Endo 2023

Diagnostic Evaluation for GERD after OAGB:

- 1. Listen to the patient! („I drawn in bile at night“….)
- 2. Gastroscopy (Bile in the Esophagus/Pouch/Length of Pouch/Width of Anastomosis)
- 3. 3D CT Volumetry (Intrathoracic migration?)
- 4. Marshmallow Test (to exclude functional stenosis)
- 5. 24h Impedance & Manometry ((Non)-Acid Refluxes, LES…)

3D-CT volumetry in OAGB +/- hiatoplasty

Table 4 GERD in OAGB patients without / with hiatoplasty and without / with ITM

	All patients	*OAGB without hiatoplasty*	*OAGB with hiatoplasty*	p-value
	(n=50)	(n=25)	(n=25)	
GERD (%)	14 (28%)	6 (24%)	8 (32%)	0.538

	All patients	Without ITM	With ITM	p-value
	(n=50)	(n=16)	(n=34)	
GERD (%)	14 (28%)	1 (6.3%)	13 (38.2%)	**0.002**

Abbreviations: OAGB: One-Anastomosis Gastric Bypass; GERD: Gastro-Esophageal Reflux Disease; ITM: Intrathoracic pouch Migration

Felsenreich D. M. et al., *Surgery for Obesity and Related Diseases 19 (2023) 492–500*

3D-CT volumetry in OAGB +/- hiatoplasty

Table 4 GERD in OAGB patients without / with hiatoplasty and without / with ITM

Hiatoplasty has no impact on GERD

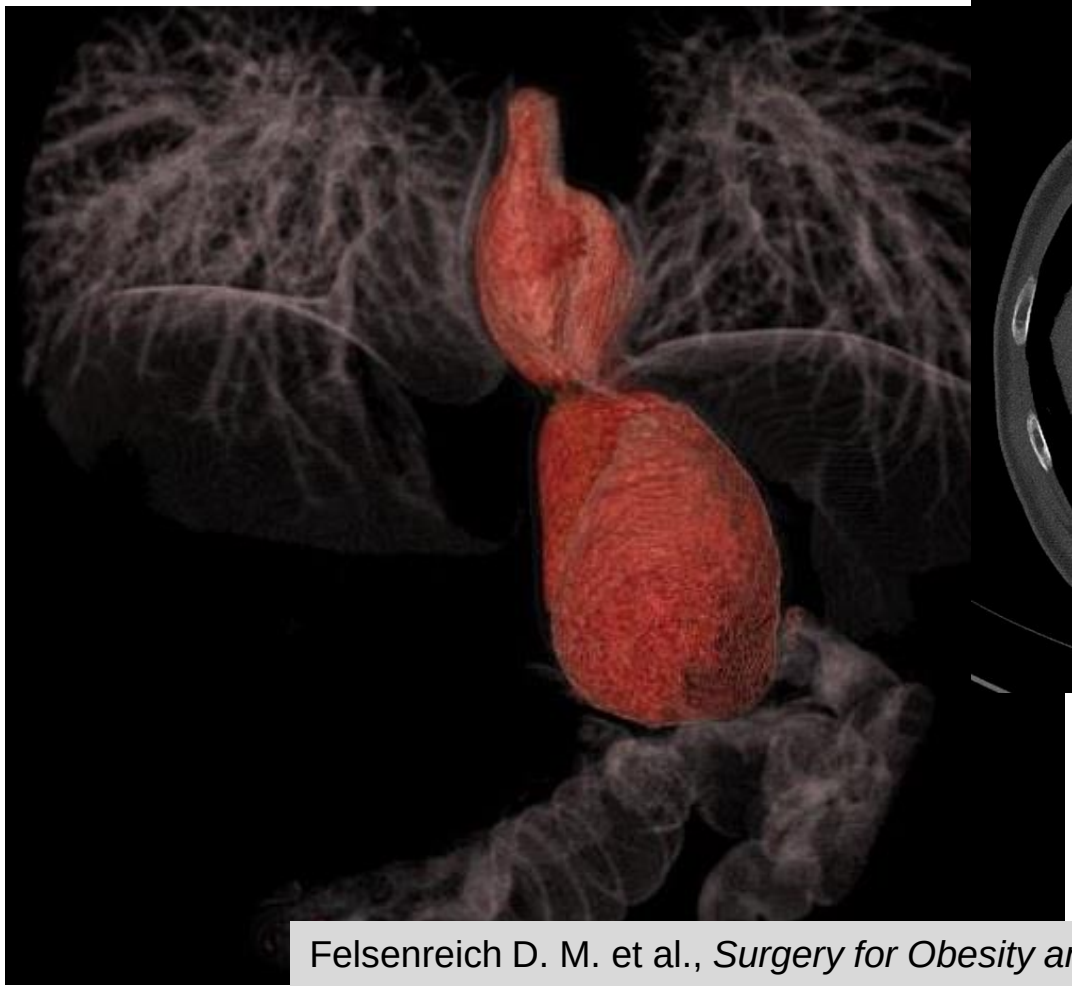
ITM drives GERD

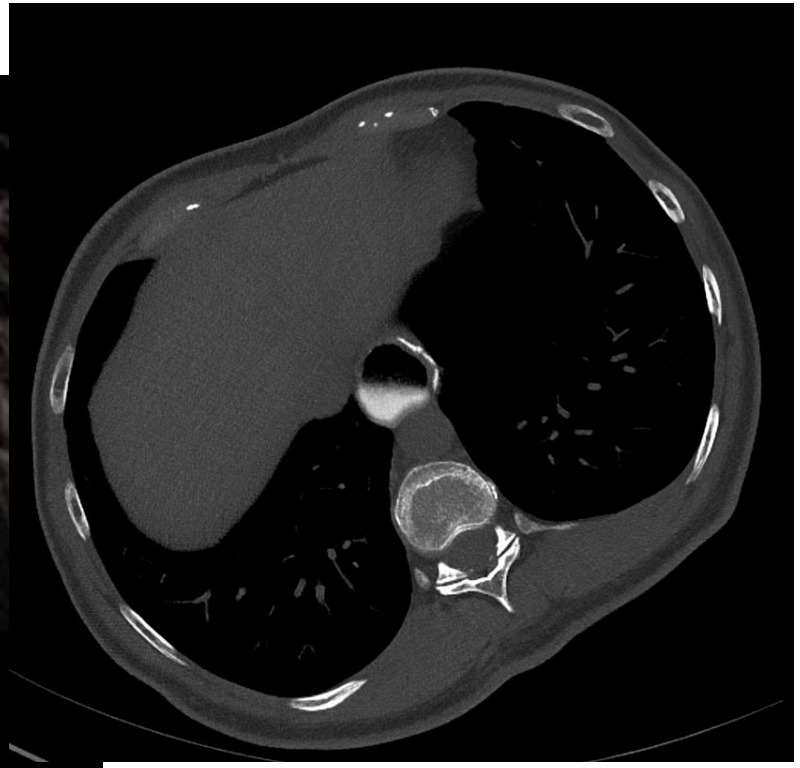
Abbreviations: OAGB: One-Anastomosis Gastric Bypass; GERD: Gastro-Esophageal Reflux Disease; ITM: Intrathoracic pouch Migration

Felsenreich D. M. et al., *Surgery for Obesity and Related Diseases 19 (2023) 492–500*

3D-CT volumetry in OAGB +/- hiatoplasty

Intrathoracic Pouch Migration in One-Anastomosis Gastric Bypass with and without Hiatoplasty – A 3D-CT-Volumetry Study





OAGB patient with ITM

Felsenreich D. M. et al., *Surgery for Obesity and Related Diseases 19 (2023) 492–500*

3D-CT volumetry in OAGB +/- hiatoplasty

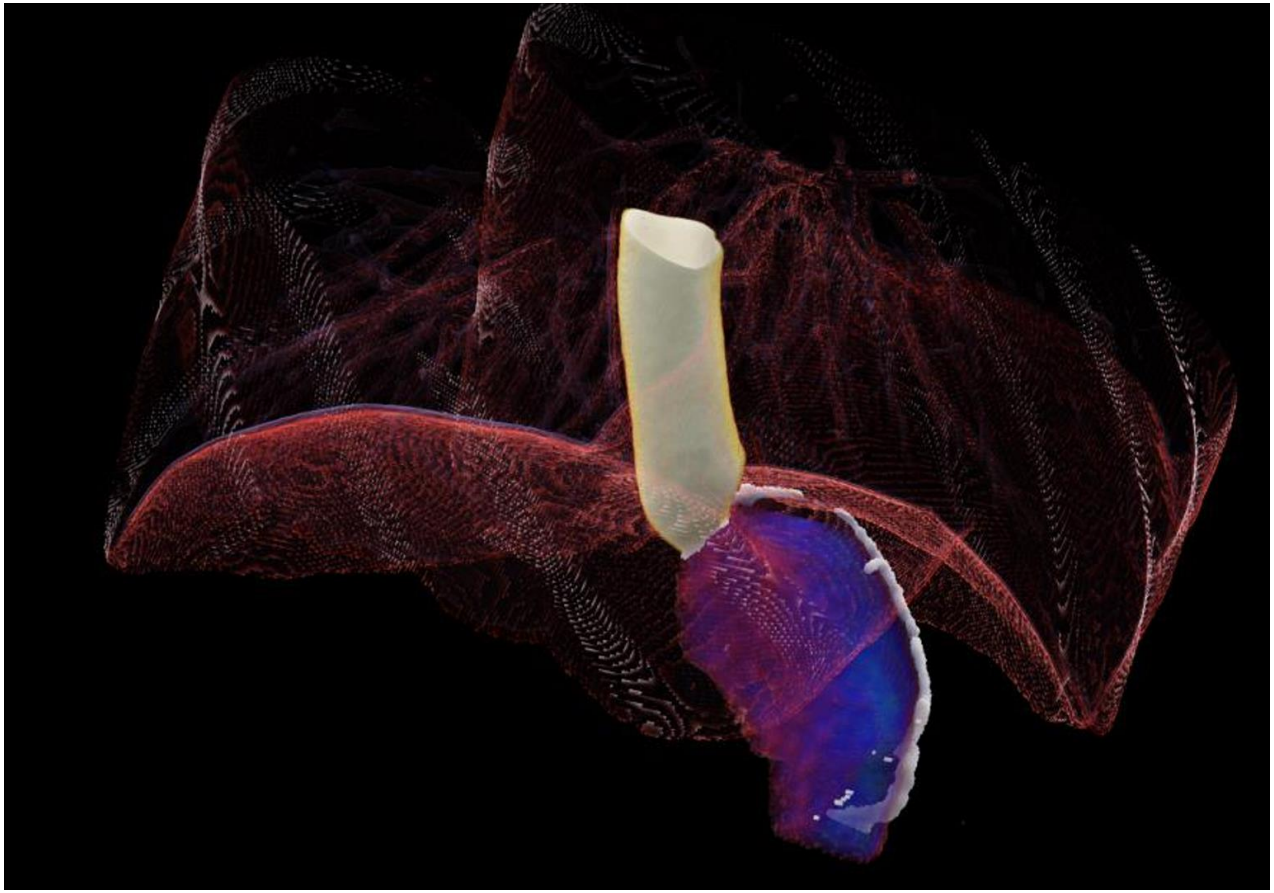
Intrathoracic Pouch Migration in One-Anastomosis Gastric Bypass with and without Hiatoplasty – A 3D-CT-Volumetry Study

OAGB with ITM

Felsenreich D. M. et al., *Surgery for Obesity and Related Diseases 19 (2023) 492–500*

3D-CT volumetry in OAGB +/- hiatoplasty

Intrathoracic Pouch Migration in One-Anastomosis Gastric Bypass with and without Hiatoplasty – A 3D-CT-Volumetry Study



OAGB patient without ITM

Felsenreich D. M. et al., *Surgery for Obesity and Related Diseases 19 (2023) 492–500*

Swallow MRI – 3D-CT volumetry

ORIGINAL CONTRIBUTIONS

Check for updates

Swallow Magnetic Resonance Imaging Compared to 3D-Computed Tomography for Pouch Assessment and Hiatal Hernias After Roux-en-Y Gastric Bypass

Daniel M. Felsenreich[1] · Michael A. Arnoldner[2] · Felix B Langer[1] · Christoph Bichler[1] · Natalie Vock[1] · Katharina Steinlechner[1] · Mahir Gachabayov[1] · Aram Rojas[1] · Dietrich Beitzke[2] · Thomas Mang[2] · Gerhard Prager[1] · Christiane Kulinna-Cosentini[2]

OBES SURG

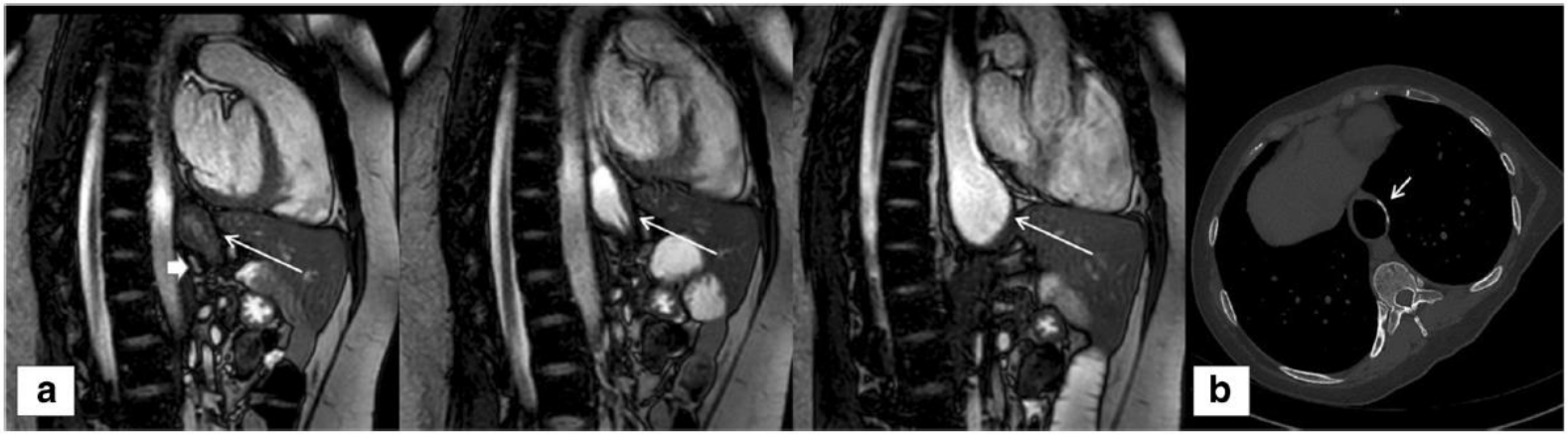


Fig. 2 A 50-year-old female who underwent RYGB, pouch resizing, and banding (**a** short, bold arrow); dynamic MRI shows filling of the pouch during fluid intake (**a** long arrows). Moderate ITM was suspected and confirmed by CT (**b** short arrow indicates staple lines above the diaphragm)

Felsenreich D. M. et al., Obesity Surgery 2020

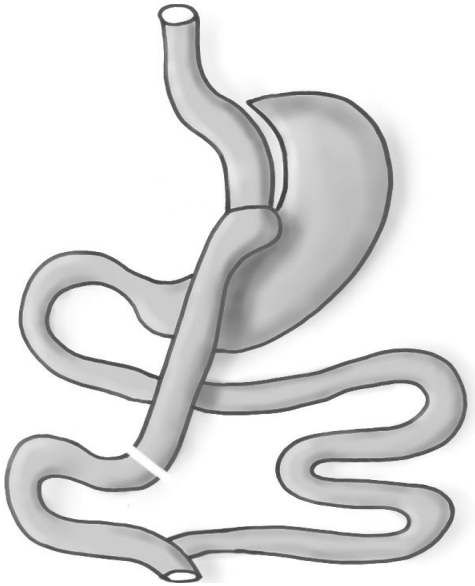
Treatment Options of Bile Reflux after OAGB:

- 1. Conversion to RYGB (AL app. 60-70cm)

- 2. Braun Anastomosis (Blind loop Syndrome - bacterial overgrowth)
- 3. Magnetic Sphincter Augmentation
- 4. Fundoplication with Remnant stomach/fundus
- 5. Lig. Teres Augmentation
- 6. Transoral Outlet Reduction (TORE)

Shahrukh Chaudhry et al: Surg Laparosc Endosc Percutan Tech Volume 34, Number 4, August 2024
Ibrahim M. et al: Surg Endoscop July 2024

GERD after RYGB



- RYGB effective for treatment of GERD
- SG → RYGB due to GERD
- Regression for Barrett by RYGB

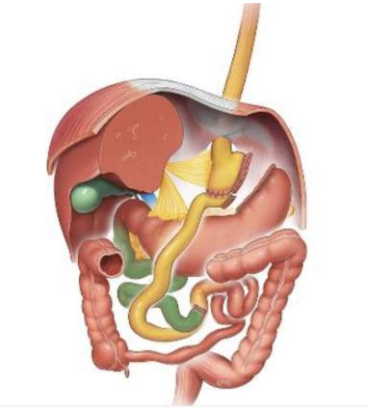
- So why do we see GERD after RYGB in some patients???
  - Retained acid secreting parietal cells in the gastric pouch
  - dysmotility of the Roux limb
  - herniation of the gastric pouch through the hiatus **(ITM)**

Possible mechanisms of GERD after RYGB

Hiatal hernia
Large gastric pouch
Candy cane syndrome
Gastrogastric fistula
Impaired esophageal clearance
Esophageal motor dysfunction
Hypotensive lower esophageal sphincter or increased transient relaxations
Pouch stasis syndrome
Short alimentary limb
Roux-en-Y stasis syndrome
Mechanical obstruction

Lezami et al. J Laparoendosc Adv Surg Tech A 2024 Vol. 34 Issue 2 Pages 167-172

Diagnostic Evaluation for GERD after RYGB:



- 1. Listen to the patient!
- 2. Gastroscopy (Biopsies from the Anastomosis, Pouch and GE Junction; Pouch size&Length; Bile, Saliva)
- 3. 24h Impedance & Manometry ((Non)-Acid Refluxes, LES…)
- 4. Marshmallow Test (to exclude functional stenosis)
- 5. 3D CT Volumetry (Intrathoracic migration?)

Management of GERD after RYGB

Summary of evidence and expert commentary.

1. Patients with GERD after RYGB should start with PPIs. In most cases, GERD symptoms will improve + **Dietitian Counseling!**

2. For patients with refractory GERD, a thorough diagnostic workup is needed to determine potential causes of GERD.

3. If an anatomical cause (e.g., large pouch, hiatal hernia, candy cane syndrome) is identified, a revisional surgery is possibly the best treatment option.

4. Novel endoscopic procedures have shown promising results, but further studies with longer follow-up are needed to strongly recommend them to treat GERD in these patients.

Lezami et al. J Laparoendosc Adv Surg Tech A 2024 Vol. 34 Issue 2 Pages 167-172

- Lig. Teres Cardiopexie
- Toupet/Nissen Fundoplication with the remnant stomach
- Magnetic Sphincter Augmentation
- TORe
- Radiofrequecy Ablation
- Hill procedure

Runkel A, Scheffel O, Marjanovic G, et al. Obes Surg 2021; 31(4):1422–1430.
Kawahara NT, Alster C, Maluf-Filho F, et al. Clinics (Sao Paulo) 2012;67(5):531–533.
Vorwald P, Restrepo Nu´ n˜ ez RM, Salcedo Caban˜ as G, et al.. Obes Surg 2019; 29(4):1432.
Pescarus R, Sharata AM, Dunst CM, et al. Surg Endosc 2016;30(5):2141–2142.
Broderick RC, Smith CD, Cheverie JN, et al.. Surg En- dosc 2020;34(7):3211–3215.
Mattar SG, Qureshi F, Taylor D, et al. Surg Endosc 2006;20(6):850–854.
Bulajic M, Vadala` di Prampero SF, Bosˇkoski I, et al. World J Gastrointest Surg 2021;13(12):1584–1596.

Risk factors for postoperative Reflux:

- **High preoperative dose of anti-reflux medication** (IRR 1.77; 95% CI, 1.60–1.96 compared with low dose)
- **Older age** (IRR 1.12; 95% CI 1.02–1.24 comparing age >50 with <40 years)
- **Female sex** (IRR 1.28; 95% CI, 1.16–1.42)
- **Comorbidity** (IRR 1.26; 95% CI, 1.14–1.39 comparing Charlson Comorbidity Index ‡2 with 0)

Holmberg D, Santoni G, Xie S, et al. Gastric bypass surgery in the treatment of gastro-oesophageal reflux symptoms. Aliment Pharmacol Ther 2019;50(2):159–166; doi: 10 .1111/apt.15274

Gastroesophageal Reflux Disease After Roux-en-Y Gastric Bypass: Pathophysiology and Management

Manuela Monrabal Lezama, MD,[1] Camila Bras Harriott, MD,[1]
Fernando A.M. Herbella, MD,[2] and Francisco Schlottmann, MD, MPH[1,3]

Overall, most studies have shown that RYGB is an effective anti-reflux operation. Therefore, this operation continues to be the preferred procedure for patients with obesity and GERD referred for bariatric surgery.

However, we should be aware that **RYGB is not an infallible procedure for GERD as it was thought**.

Lezami et al. J Laparoendosc Adv Surg Tech A 2024 Vol. 34 Issue 2 Pages 167-172

Although there are some cases of persistence or de novo GERD after RYGB, it remains the most effective bariatric procedure to prevent postoperative esophagitis, as compared with one anastomosis gastric bypass and SG.

Eldredge TA, Bills M, Ting YY, et al. Once in a bile: The incidence of bile reflux post-bariatric surgery. Obes Surg 2022;32(5):1428–1438.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FOR THE SURGERY OF OBESITY AND METABOLIC DISORDERS
- EUROPEAN CHAPTER -

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C. Bichler
M. Felsenreich
J. Jedamzik
M. Mairinger
L. Gensthaler
L. Nixdorf
J. Eichelter
P. Richwien
N.Vogt
Chr Mölzer
D. Zrubecka

I. Kristo

B. Dreschl
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B. Andersen

M. Krebs
F. Kiefer
B. Itariu
Th. Scherer

E. Fleischmann
M. Trauner
Th. Reiberger

A. Ba-Salamah
M. Arnoldner

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Letter to the editor regarding the study of Ruiz-Tovar et al.: "Long-term follow-up after sleeve gastrectomy versus Roux-en-Y gastric bypass versus one-anastomosis gastric bypass: a prospective randomized comparative study of weight loss and remission of comorbidities."

Daniel M Felsenreich[1], Felix B Langer[1], Jacques Himpens[2], Marco Bueter[3], Scott A Shikora[4], Martin Fried[5], Michel Suter[6,17], Luigi Angrisani[7], Ralph Peterli[8], Torsten Olbers[9], Ronald Liem[10], Antonio J Torres[11], Paulina Salminen[12], Jean-Marc Chevallier[13], Almino Ramos[14], Lilian Kow[15], Nicola Di Lorenzo[16], Gerhard Prager[1*]

5. The process of stratification of subjects into the three groups is **not described** in the paper. However, each group includes exactly 150 female and 50 male patients, which requires clarification indeed. Please note that probability of this distribution occurring naturally is **3.6×10^{-141}**.

6. The authors report a mortality rate of **0% in 600 patients after 5 years**, which is highly unlikely indeed: probability is **4.3×10^{-14}**. Arterburn et al. studied mortality after bariatric surgery and found a mortality rate of **6.4% in 2500 patients after 5 years** [8]. Adams et al. reported a mortality rate of **3%** (n=12) **6 years after RYGB** and 3% (n=14) in the non-operated control group [9].

ORIGINAL CONTRIBUTIONS

150-cm Versus 200-cm Biliopancreatic Limb One-Anastomosis Gastric Bypass: Propensity Score–Matched Analysis

Thibaud Bertrand[1,2] · Claire Rives-Lange[1,3] · Anne-Sophie Jannot[1,4,5,6] · Clement Baratte[1,2] · Flore de Castelbajac[1,3] · Estelle Lu[4] · Sylvia Krivan[7] · Maud Le Gall[1,8] · Claire Carette[1,3] · Sebastien Czernichow[1,3,9] · Jean-Marc Chevallier[1,2] · Tigran Poghosyan[1,2,8]

monocentric retrospective matched cohort study
BMI 35 - 50 kg/m2
OAGB-150 (n=392) or OAGB-200 (n=392) matched 1:1 based on age, sex, and BMI

Compared to OAGB-200 in patients with BMI ≤ 50 kg/m2,
OAGB150 results in fewer nutritional deficiency
rates long term, **without impairing weight loss**.

Obesity Surgery (2022) 32:2839–2845

ADVANCES IN SURGICAL TECHNIQUE

Long-limb Gastric Bypass in the Superobese

A Prospective Randomized Study

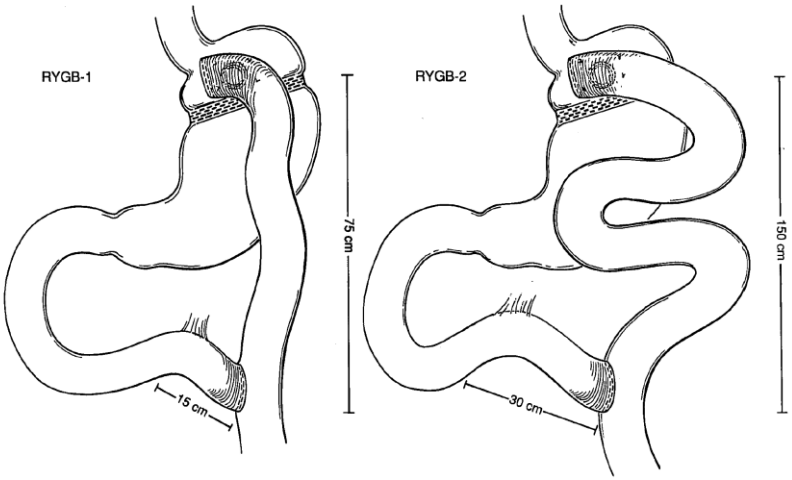


FIG. 1. (Left) In the conventional modification of gastric bypass (RYGB-1), the jejunum was transected 15 cm beyond the ligament of Treitz and the jejunojejunostomy was performed at a measured distance of 75 cm distal to the gastrojejunostomy. (Right) In the experimental group (RYGB-2), the jejunum was transected 30 cm distal to the ligament of Treitz and the jejunojejunostomy was created at a measured distance of 150 cm from the gastrojejunostomy.

45 patients

22p with 75cm AL
23p with 150cm AL

75cm AL 50% EWL after 24months
150cm AL 64% EWL after 24months

Brolin et al: Ann Surg 1992; 4(215) 387-395

Long-limb Gastric Bypass in the Superobese

A Prospective Randomized Study

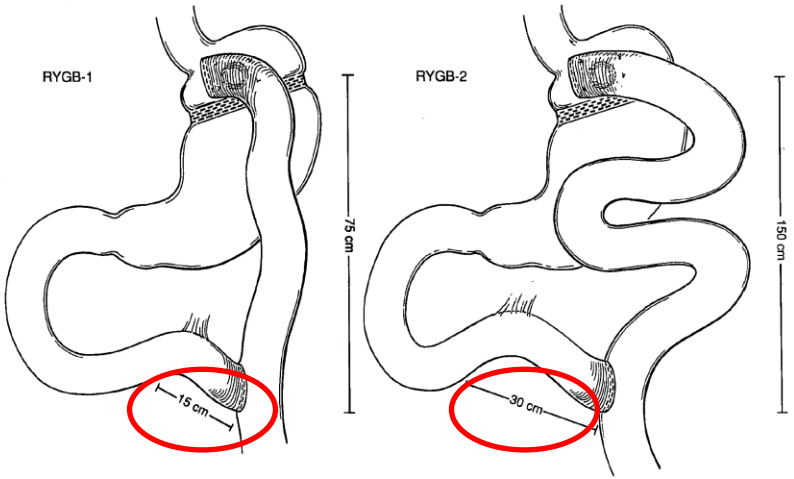
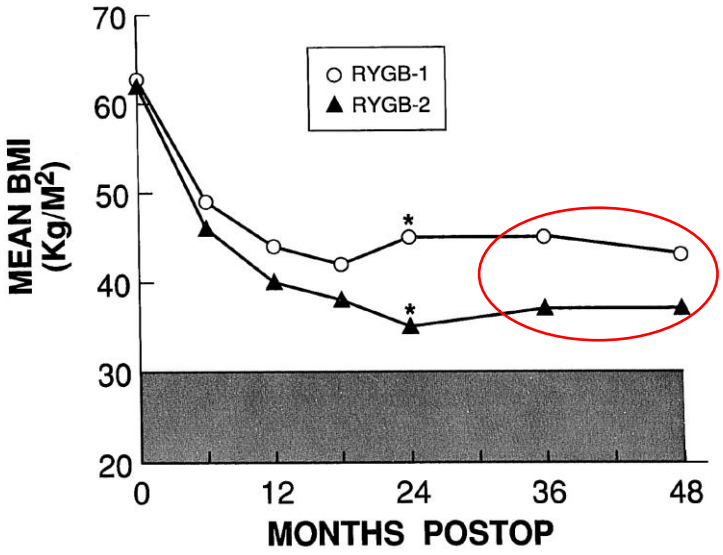


FIG. 1. (Left) In the conventional modification of gastric bypass (RYGB-1), the jejunum was transected 15 cm beyond the ligament of Treitz and the jejunojejunostomy was performed at a measured distance of 75 cm distal to the gastrojejunostomy. (Right) In the experimental group (RYGB-2), the jejunum was transected 30 cm distal to the ligament of Treitz and the jejunojejunostomy was created at a measured distance of 150 cm from the gastrojejunostomy.



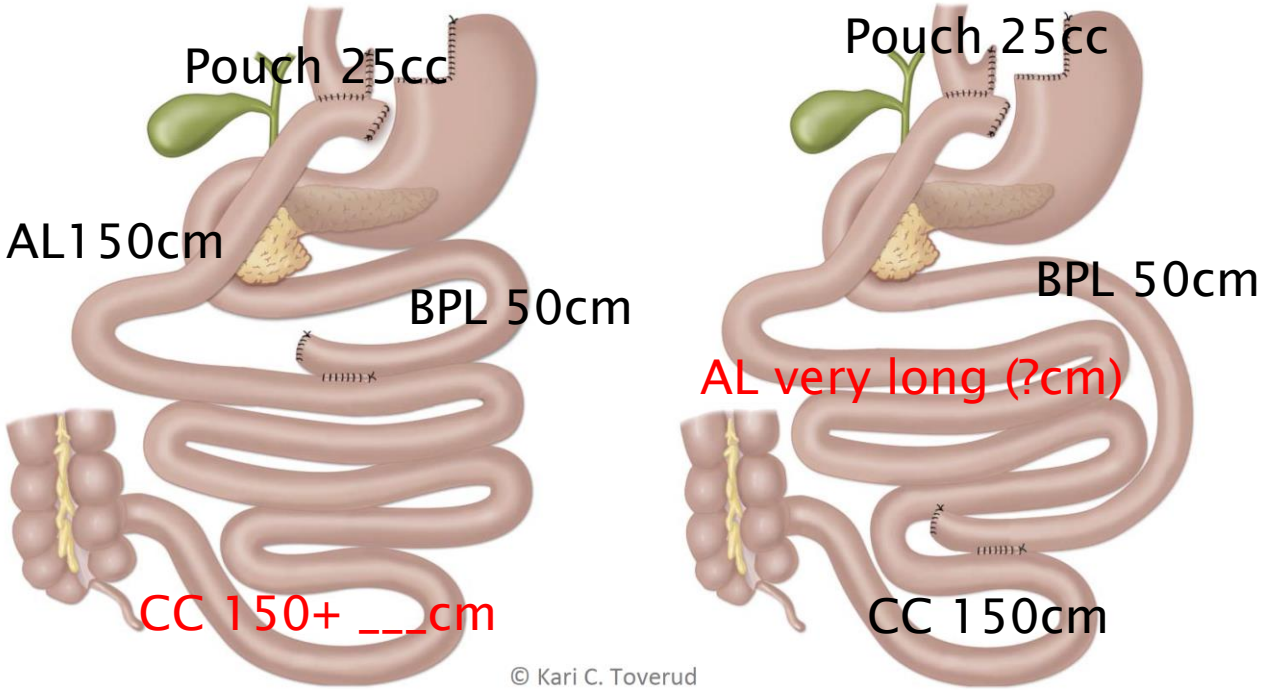
Brolin et al: Ann Surg 1992; 4(215) 387-395

JAMA Surgery | Original Investigation

Standard vs Distal Roux-en-Y Gastric Bypass in Patients With Body Mass Index 50 to 60

A Double-blind, Randomized Clinical Trial

Hilde Risstad, MD; Marius Svanevik, MD; Jon A. Kristinsson, MD, PhD; Jøran Hjelmesæth, MD, PhD; Erlend T. Aasheim, MD, PhD; Dag Hofsø, MD, PhD; Torgeir T. Søvik, MD, PhD; Tor-Ivar Karlsen, PhD; Morten W. Fagerland, MSc, PhD; Rune Sandbu, MD, PhD; Tom Mala, MD, PhD



Standard gastric bypass Distal gastric bypass

JAMA Surgery December 2016 Volume 151, Number 12; 1146-1155

JAMA Surgery | Original Investigation

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double-blind, randomized clinical trial
113 patients with a body mass index of 50 to 60kg/m^2

BMI loss **17.8** two years after standard gastric bypass

BMI loss **17.2** two years after distal gastric bypass,

a nonsignificant difference.

JAMA Surgery December 2016 Volume 151, Number 12; 1146-1155

Gastric Bypass with Long Alimentary Limb or Long Pancreato-Biliary Limb—Long-Term Results on Weight Loss, Resolution of Co-morbidities and Metabolic Parameters

Bent Johnny Nergaard · Björn Geir Leifsson · Jan Hedenbro · Hjörtur Gislason

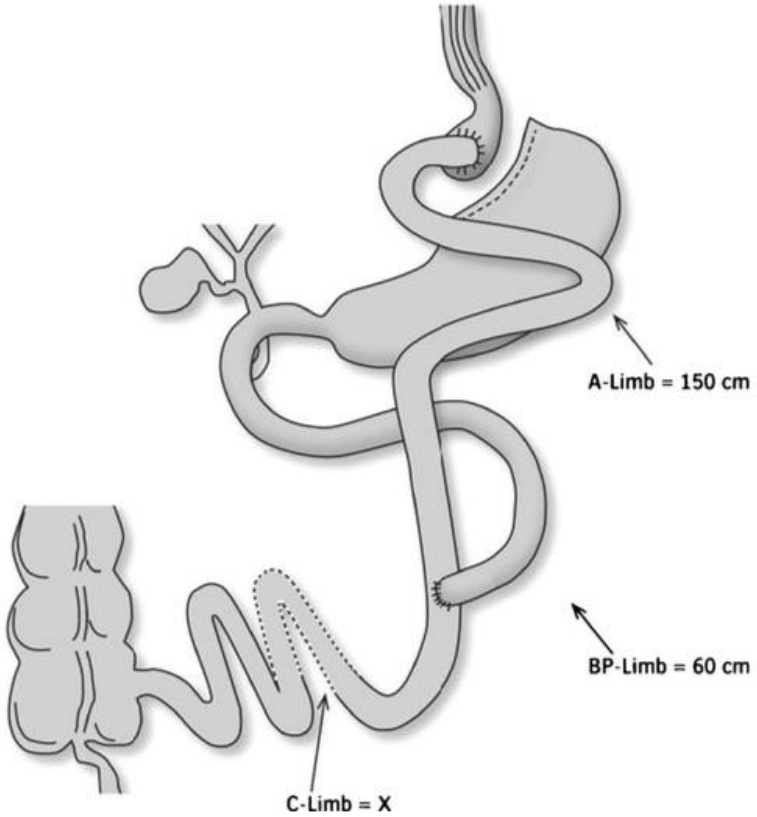
prospective randomized study

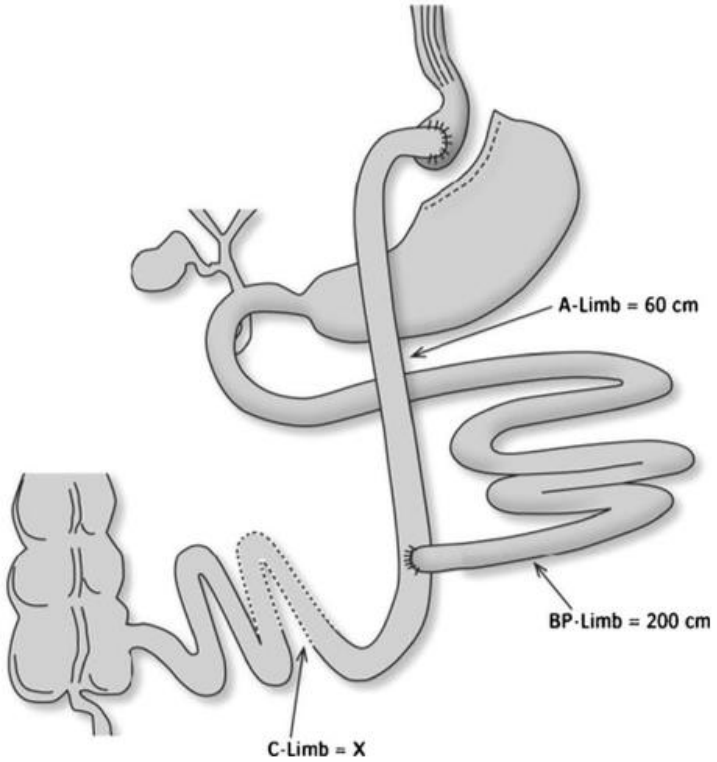
187 patients

5 years 85% FU

Nergaard et al. Obes Surg 2014: 1595

Gastric Bypass with Long Alimentary Limb or Long Pancreato-Biliary Limb—Long-Term Results on Weight Loss, Resolution of Co-morbidities and Metabolic Parameters





Nergaard et al. Obes Surg 2014: 1595

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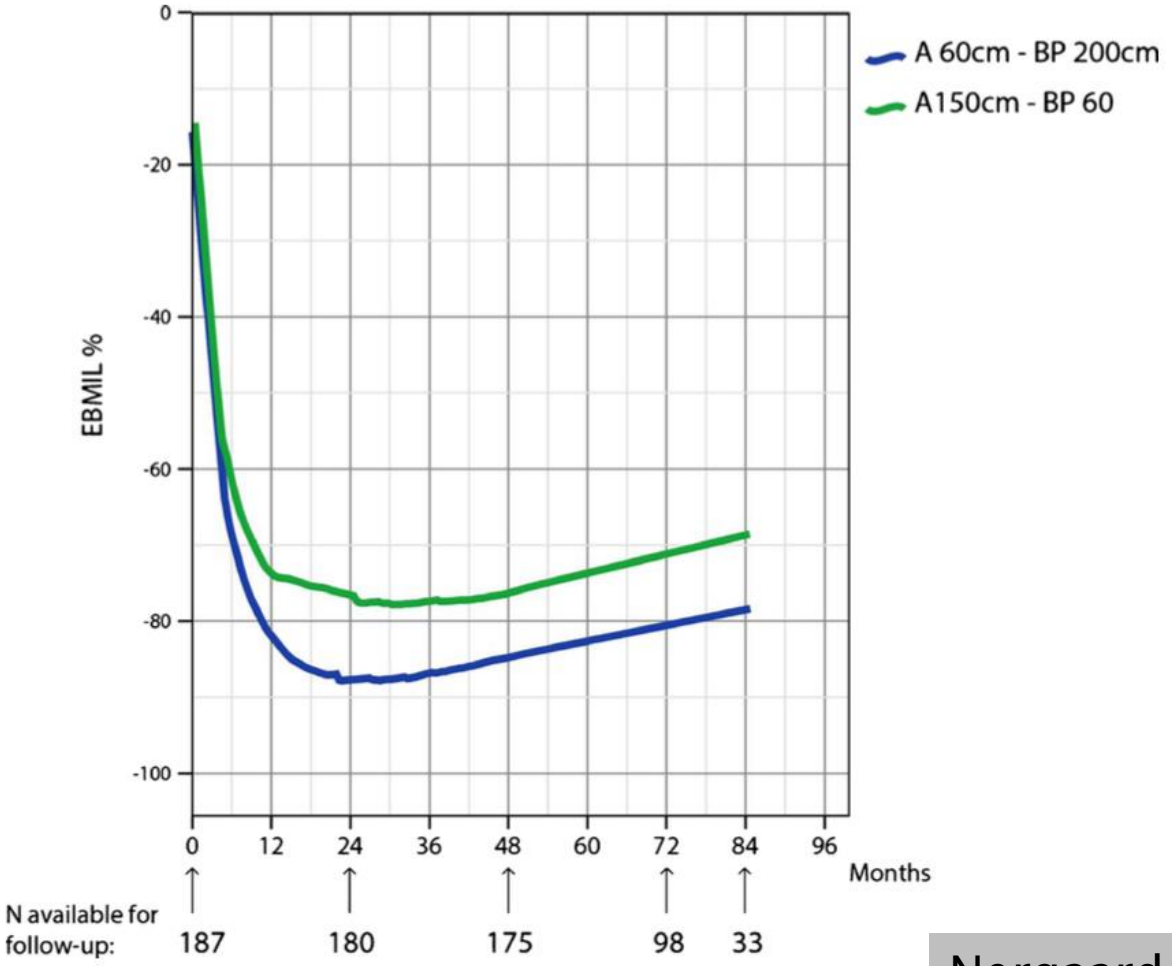


Nergaard et al. Obes Surg 2014: 1595

OBES SURG (2017) 27:2956–2967
DOI 10.1007/s11695-017-2726-2

ORIGINAL PAPER

Complications Following the Mini/One Anastomosis Gastric Bypass (MGB/OAGB): a Multi-institutional Survey on 2678 Patients with a Mid-term (5 Years) Follow-up

Mario Musella[1] · Antonio Susa[2] · Emilio Manno[3] · Maurizio De Luca[4] · Francesco Greco[5] · Marco Raffaelli[6] · Stefano Cristiano[7] · Marco Milone[1] · Paolo Bianco[1] · Antonio Vilardi[2] · Ivana Damiano[3] · Gianni Segato[4] · Laura Pedretti[5] · Piero Giustacchini[6] · Domenico Fico[7] · Gastone Veroux[8] · Luigi Piazza[8]

- Weight regain in 11 patients
- Defined as >10kg of lowest weight/<25%EBMIL

Musella et al., Obes Surg 2017

Musella et al., Obes Surg 2017

Weight Regain – Treatment

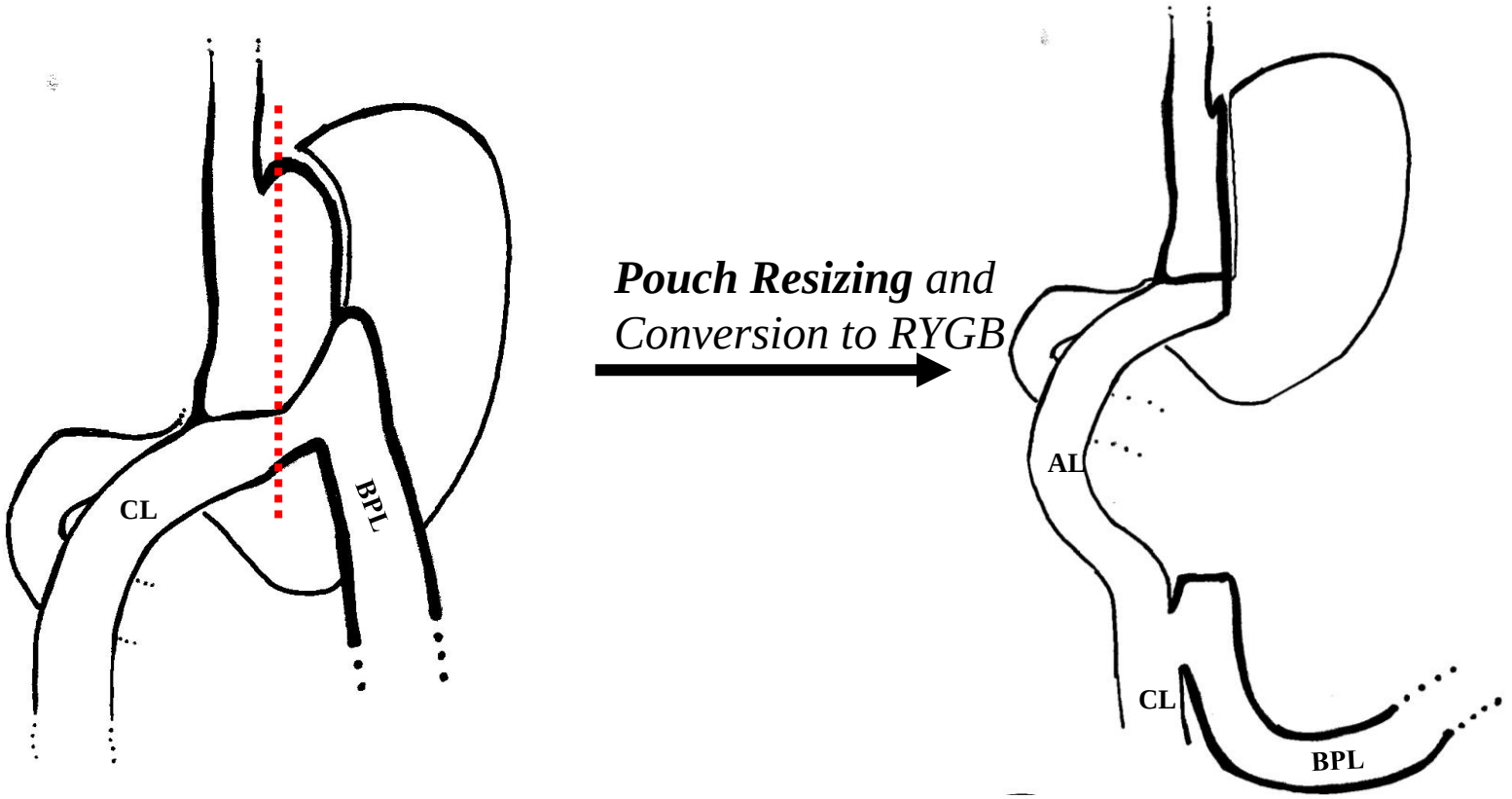
Table 3 Late complications rate and their management

Late complications	A	B	C	Treatment	Total	Percent
5 years FU	65	226	392		683/1091	62.6
Marginal ulcer	2	5	1	3—PPI treatment 4—laparoscopic repair 1—laparotomic repair	8	1.1
DGER	3[a] + 6	7[a] + 4	2[a] + (2)[a] + 4	9—RY laparoscopic conversion 3—Braun laparoscopic anastomosis 16—conservative treatment	14[a] + 14	4.0 (0.2)
Anastomotic stenosis	1	1	1	2—endoscopic balloon treatment 1—RY laparoscopic conversion	3	0.4
Steathorrea/excessive weight loss	1	3	1	2—conservative treatment 1—restaurative laparoscopic surgery 2—loop resizing	5	0.7
Internal hernias	0	0	(1)	1—laparoscopic repair	1	0.1
Gastric leak	0	0	1	1—conservative treatment	1	0.1
Weight regain	4 + (3)	3	1	4—laparoscopic pouch resizing 7—loop resizing	11	1.6
Anemia	0	8 + (4)	0	12—drug therapy	12	1.7
Total	20/65 30.7%	35/226 15.4%	14/392 3.5%	69	69/683	10.1

Musella et al., Obes Surg 2017

Weight Regain – how (we) revised

Conversion to RYGB



Jedamzik et al., SOARD 2022

OAGB – What and how to revise?

1. Insufficient weight loss/weight regain
2. Malnutrition
3. Stenosis
4. Internal hernia
5. Marginal Ulceration
6. Alkaline Reflux

ELSEVIER

CrossMark

Surgery for Obesity and Related Diseases 11 (2015) 321–327

SURGERY FOR OBESITY AND RELATED DISEASES

Original article

Single anastomosis or mini-gastric bypass: long-term results and quality of life after a 5-year follow-up

Matthieu Bruzzi, M.D.*, Cédric Rau, M.D., Thibault Voron, M.D., Martino Guenzi, M.D., Anne Berger, M.D., Ph.D., Jean-Marc Chevallier, M.D., Ph.D.

Hôpital Européen Georges Pompidou, Paris, France

Received April 28, 2014; accepted September 3, 2014

- Complete follow-up available in 126 of 175 patients (72%)
- severe malnutrition n=2 (1.6%)
- BPL 200cm

OAGB: Nutritional issues

Severe malnutrition: 2 patients (1.6%) with EBMIL: 122 and 124kg/m²
→ Revisional surgery considered

Mean Hb level: 10.4 g/dl (all patients!)

Anemia: 4 patients (3.2%) (Hb level <8g/dL + ferritin level <20ng/mL)

Bruzzi M et al., SOARD 2015

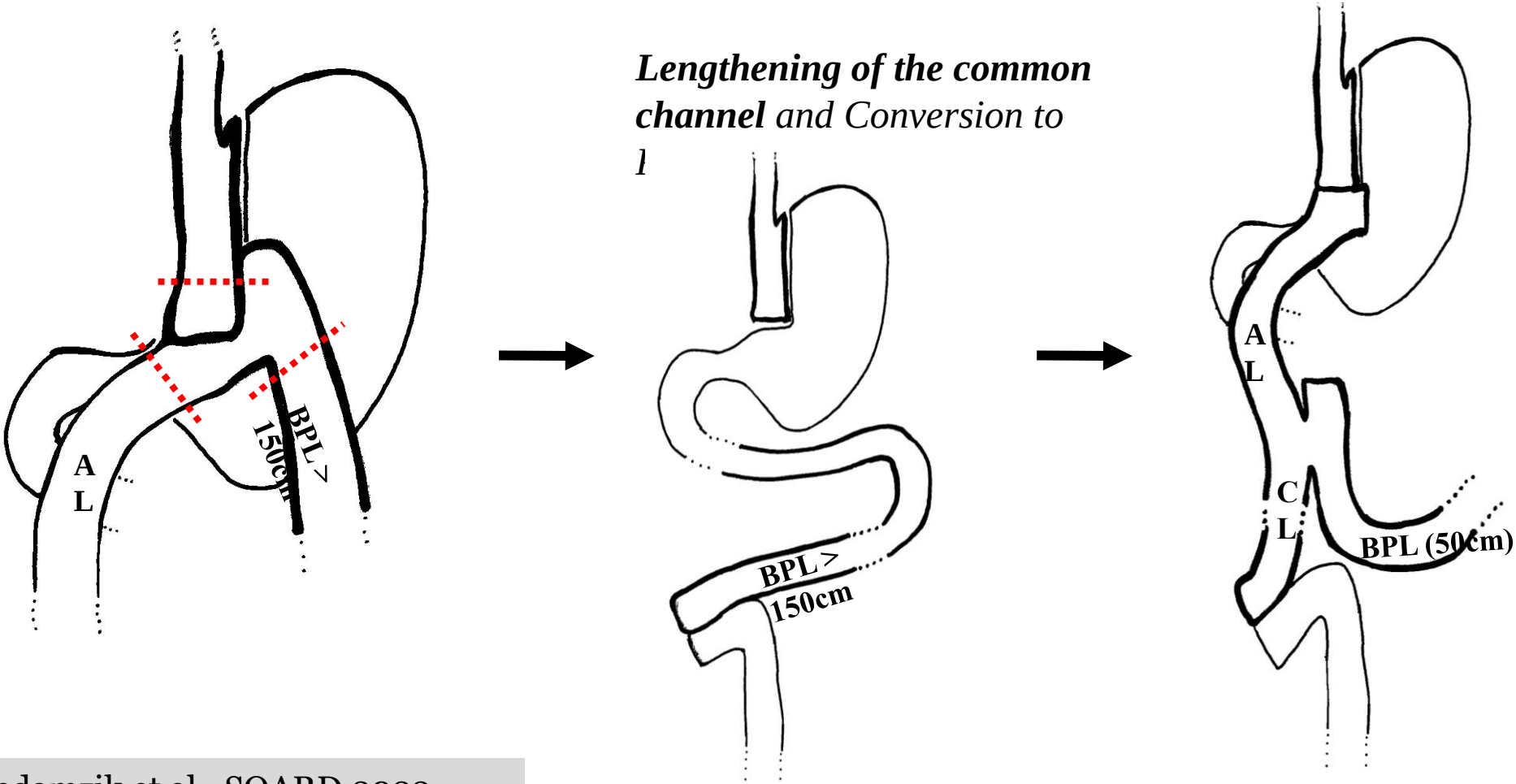
Malnutrition to liver failure – treatment algorithm

Depending on severity a step up aproach is chosen:

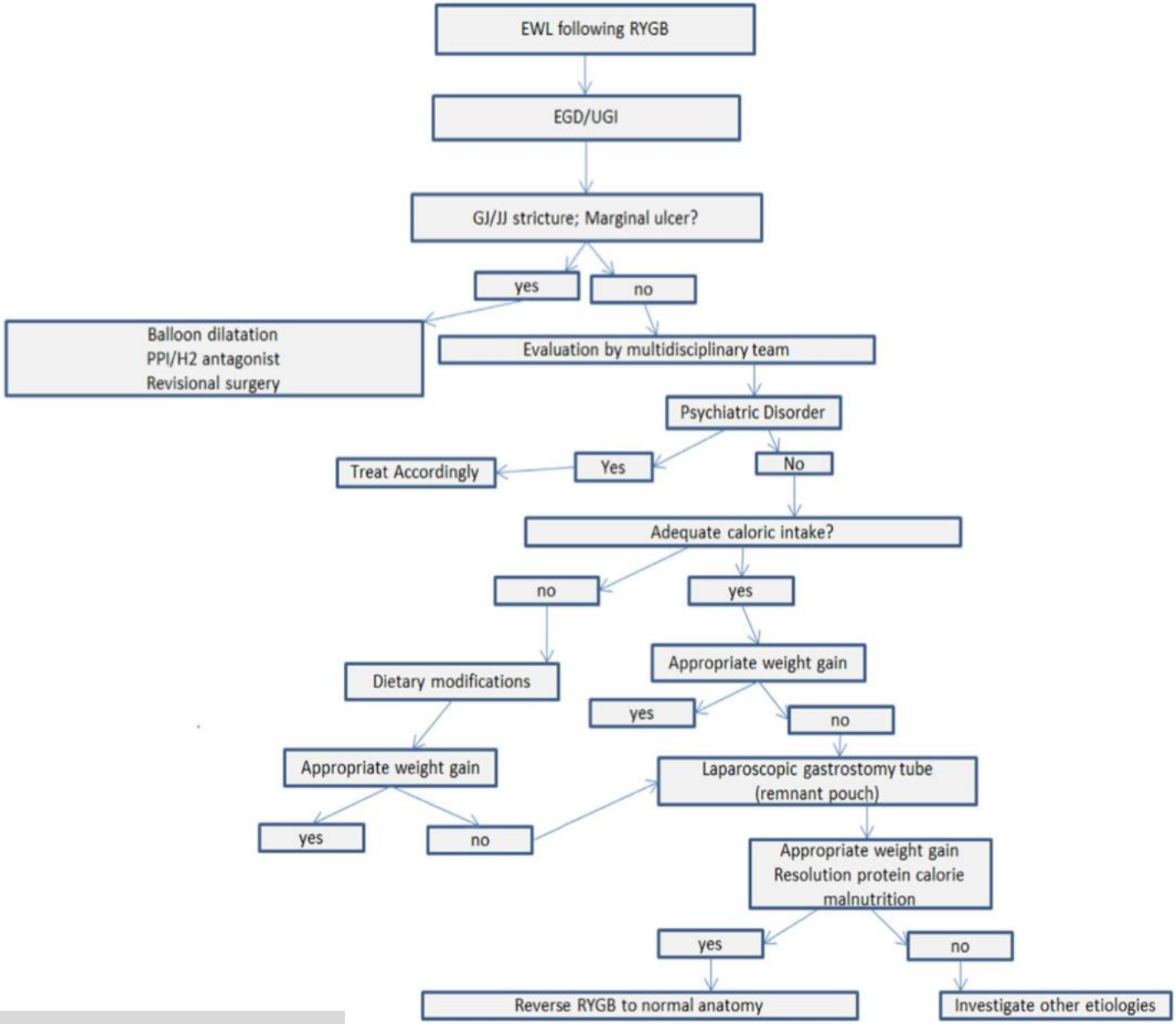
- Revision of problems at GJS
- Lenghtening of bpl limb

- Gastric tube in remnant stomach
- Restoring to normal anatomy

Malnutrition– how (we) revised



Jedamzik et al., SOARD 2022



Akusoba et al., Obes Surg 2015

OAGB – What and how to revise?

1. Insufficient weight loss/weight regain
2. Malnutrition
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4. Marginal Ulceration
5. Internal hernia
6. Alkaline Reflux

Obesity Surgery (2020) 30:4206–4217
https://doi.org/10.1007/s11695-020-04775-y

ORIGINAL CONTRIBUTIONS

One Anastomosis Gastric Bypass with a Biliopancreatic Limb of 150 cm: Weight Loss, Nutritional Outcomes, Endoscopic Results, and Quality of Life at 8-Year Follow-Up

Arnaud Liagre[1] · Tarek Debs[2] · Radwan Kassir[3] · Alain Ledit[4] · Gildas Juglard[1] · Mael Chalret du Rieu[1] · Andrea Lazzati[5] · Francesco Martini[1] · Niccolo Petrucciani[2,6]

Published online: 20 June 2020

Procedure	*N* (%)
Cholecystectomy	11 (9.5%)
Conversion to RYGB	7 (7.6%)
Explorative laparoscopy*	2 (1.7%)
Suture of perforated marginal ulcer	1 (0.8%)
Correction of internal hernia	1 (0.8%)
Abdominal wall surgery	1 (0.8%)

* In 6 cases for intractable reflux, in 1 case for chronic diarrhea

Data are presented as absolute number (percentage)

RYGB Roux-en-Y gastric bypass

Liagre et al., Obes Surg 2020

Outcomes of Omega Loop Gastric Bypass, 6-Years Experience of 1520 Cases

Osama Taha [1,2,3] · Mahmoud Abdelaal [1,2,3] · Mohamed Abozeid [2,4] · Awny Askalany [1,2,3] · Mohamed Alaa [2]

Table 5 Late postoperative complications

	Number of patients	Percent	No. of patients treated by surgical intervention
Gastric pouch enlargement	3	0.2%	0/3
Trocar site hernia	0	0%	0/0
Anastomotic ulcer	3	0.2%	0/3
EWL >100%	3	0.2%	3/3
Iron deficiency anemia	47	3.1%	0/47
Weight gain	18	1.2%	0/18
Interactable reflux	18	1.2%	3/18
Total	92	6.1%	6/92

Taha et al., Obes Surg 2017

Original article

Surgical revision of loop ("mini") gastric bypass procedure: multicenter review of complications and conversions to Roux-en-Y gastric bypass

William H. Johnson, M.D.[a], Adolfo Z. Fernanadez, M.D.[b], Timothy M. Farrell, M.D.[c], Kenneth G. MacDonald, M.D.[d], John P. Grant, M.D.[a], Ross L. McMahon, M.D.[a], Aurora D. Pryor, M.D.[a], Luke G. Wolfe, M.S.[e], Eric J. DeMaria, M.D.[a,e,*]

[a]*Department of Surgery, Duke University Medial Center, Durham, North Carolina*
[b]*Department of Surgery, Wake Forest University Baptist Medical Center, Winston-Salem, North Carolina*
[c]*Department of Surgery, University of North Carolina Health Care System, Chapel Hill, North Carolina*
[d]*Department of Surgery, East Carolina University School of Medicine, Greenville, North Carolina*
[e]*Department of Surgery, Virginia Commonwealth University Health System, Richmond, Virginia*

Received June 12, 2006; revised September 21, 2006; accepted September 28, 2006

5 medical centers

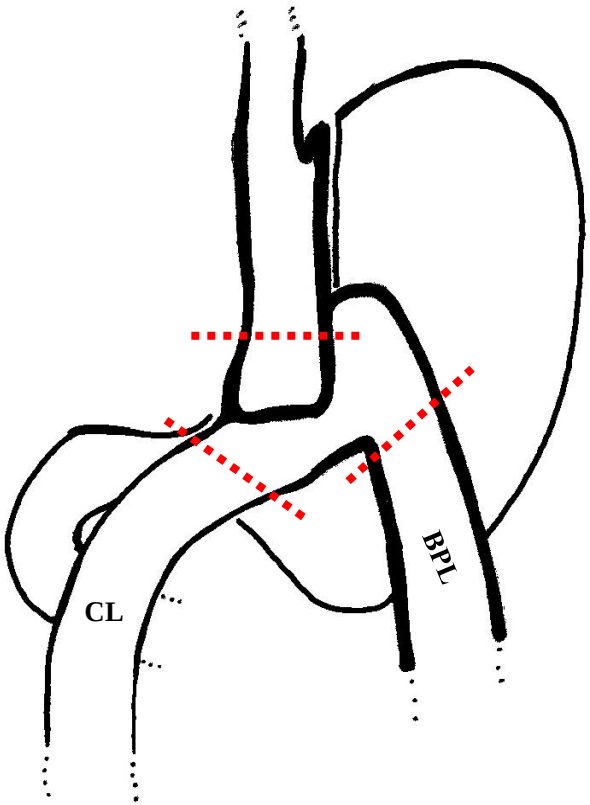
32 patients with complications

3 leaks
20 bile reflux
5 marginal ulcers
8 malnutrition
2 weight regain

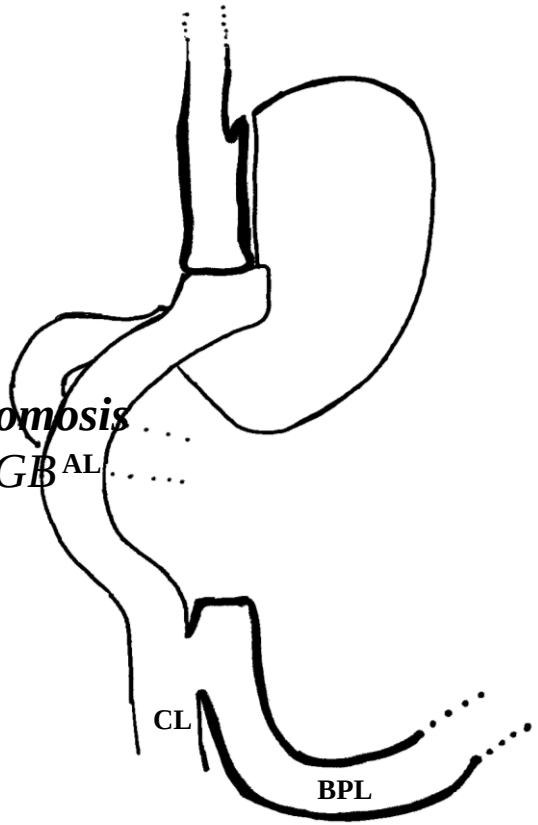
Johnson et al, SOARD 2015

Marginal ulcer/ Stenosis – how we revise

Anastomotic redo and conversion to RYGB …



Resection of the anastomosis
and Conversion to RYGB



Jedamzik et al., SOARD 2022

OAGB – What and how to revise?

1. Insufficient weight loss/weight regain
2. Malnutrition
3. Stenosis
4. Marginal Ulceration
5. Internal hernia
6. Alkaline Reflux

Petersen's internal hernia complicating a laparoscopic omega loop gastric bypass

Laurent Genser, M.D.[a,*], Sergio Carandina, M.D.[b], Antoine Soprani, M.D.[c]

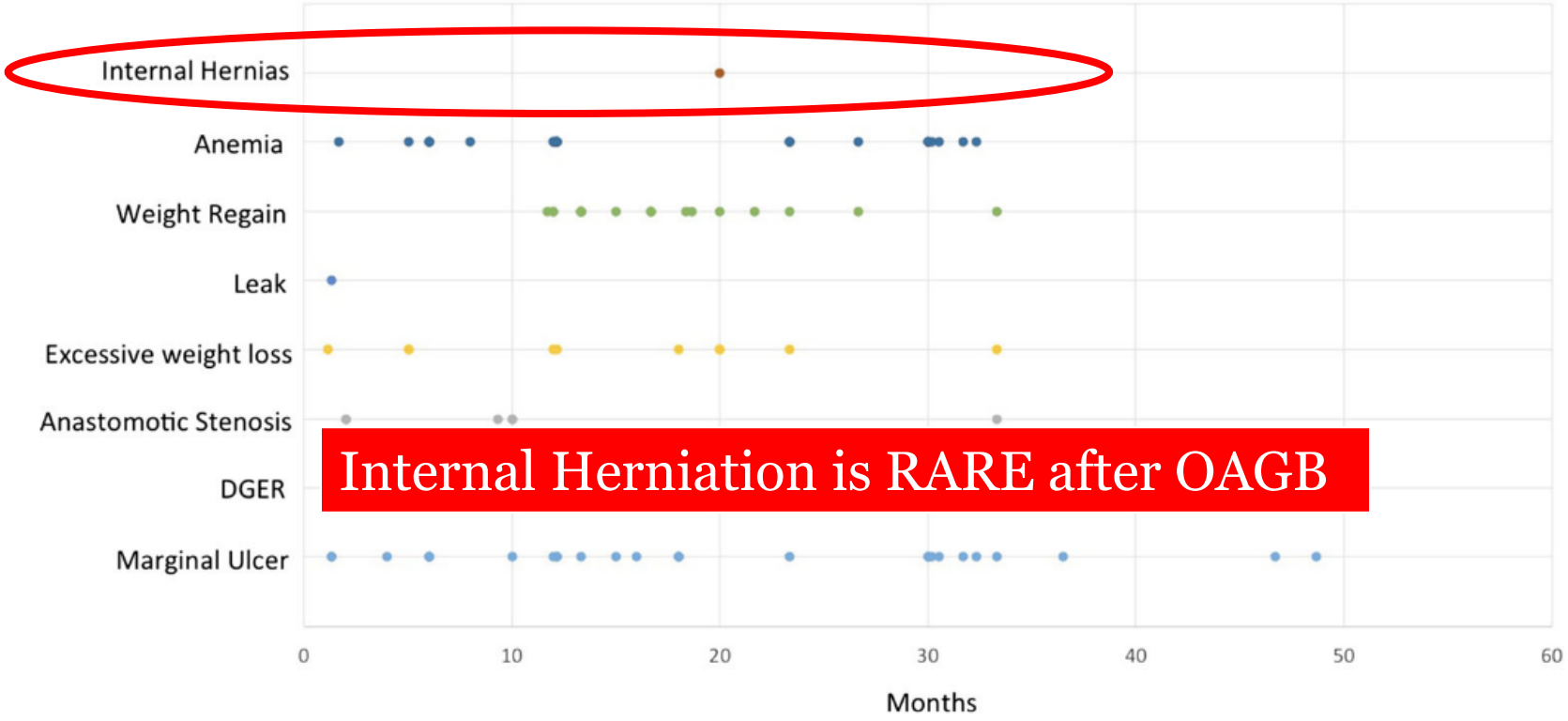
[a]*Department of Digestive and Hepato-Pancreato-Biliary Surgery, Assistance Publique-Hôpitaux de Paris (AP-HP), Pitié-Salpêtrière University Hospital, Pierre & Marie Curie University, Paris, France*

[b]*Department of Digestive and Metabolic Surgery, Jean Verdier Hospital, Centre Intégré Nord Francilien de la prise en charge de l'Obésité (CINFO), Université Paris XIII-UFR SMBH "Léonard de Vinci," AP-HP, Bondy, France*

[c]*Department of Digestive Surgery, Clinique Geoffroy-Saint Hilaire, Paris, 75005, France*

- 18 months after OLGB
- BMI 39 to 24 kg/m²
- 3 months history of transient and sudden-onset intense cramping epigastric pain associated with nausea and triggered by meals

Genser L et al. SOARD 2015



Internal Herniation is RARE after OAGB

Musella et al., Obes Surg 2017

OAGB – What and how to revise?

1. Insufficient weight loss/weight regain
2. Malnutrition
3. Stenosis
4. Marginal Ulceration
5. Internal hernia
6. Alkaline Reflux

OAGB: Alkaline reflux

One Thousand Consecutive Mini-Gastric Bypass: Short- and Long-term Outcome

Roger Noun · Judith Skaff · Edward Riachi · Ronald Daher · Nayla Abi Antoun · Marwan Nasr

0.4% alkaline reflux (4/1000)

The laparoscopic mini-gastric bypass: the Italian experience: outcomes from 974 consecutive cases in a multicenter review

M. Musella · A. Susa · F. Greco · M. De Luca · E. Manno · C. Di Stefano · M. Milone · R. Bonfanti · G. Segato · A. Antonino · L. Piazza

0,9% alkaline reflux (8/974)

A 6-Year Experience with 1,054 Mini-Gastric Bypasses—First Study from Indian Subcontinent

K. S. Kular · N. Manchanda · R. Rutledge

2,0 % alkaline reflux (18/1054)

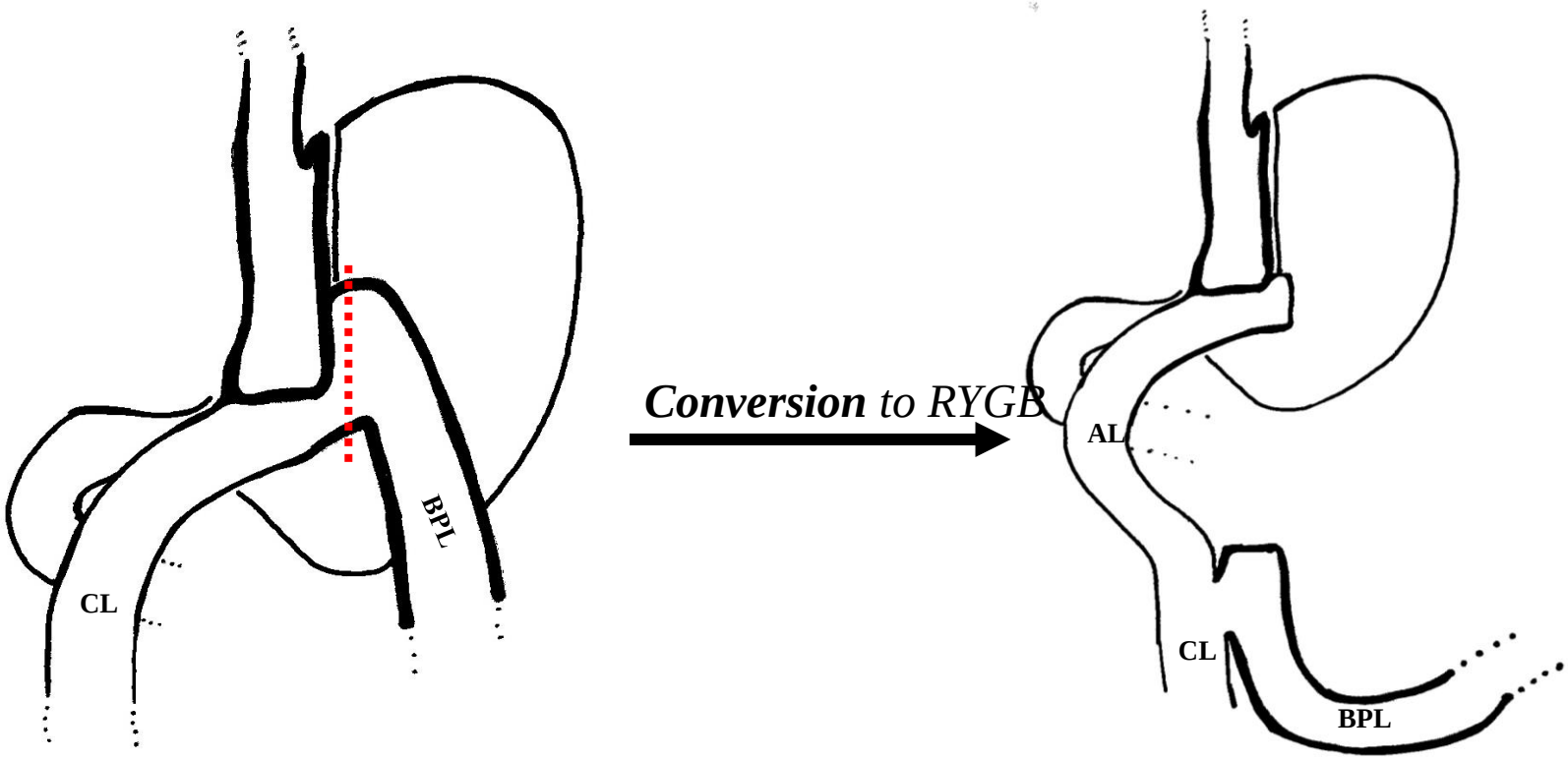
One Thousand Single Anastomosis (Omega Loop) Gastric Bypasses to Treat Morbid Obesity in a 7-Year Period: Outcomes Show Few Complications and Good Efficacy

Jean Marc Chevallier · Gustavo A. Arman · Martino Guenzi · Cedric Rau · Mathieu Bruzzi · Nathan Beaupel · Frank Zinzindohoué · Anne Berger

0,7% alkaline reflux (7/1000)

GERD – how we revise

Conversion to RYGB as the treatment of choice …



Jedamzik et al., SOARD 2022

Obesity Surgery (2020) 30:4206–4217
https://doi.org/10.1007/s11695-020-04775-y

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Published online: 20 June 2020

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RYGB Roux-en-Y gastric bypass

Liagre et al., Obes Surg 2020

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Published online: 20 June 2020

- 115 patients: 46 with Upper GI endoscopy at 8y
- Esophagitis in 4.6%
- Conversion to RYGB after a mean of 32 months
- No Barrett‘s Metaplasia

Liagre et al., Obes Surg 2020

OAGB: Need for revisional surgery

JAMA Surgery | Original Investigation

Reoperations After Bariatric Surgery in 26 Years of Follow-up of the Swedish Obese Subjects Study

Stephan Hjorth, PhD; Ingmar Näslund, MD, PhD; Johanna C. Andersson-Assarsson, PhD; Per-Arne Svensson, PhD; Peter Jacobson, MD, PhD; Markku Peltonen, PhD; Lena M. S. Carlsson, MD, PhD

OAGB subgroup

- 51 patients
- 14 patients converted to RYGB
- Time to conversion ranges from 1 to 10 years after OAGB

Hjorth et al., JAMA Surgery 2019

There are other reasons too…

Cholecystolithiasis

Plastic reconstructive surgery

Exploratory laparoscopy

Conclusion

- Excellent long term results concerning weight loss/loss of comorbidities
- Revisional surgery is necessary for some patients; time to RBS varies widely
- Reoperation rate stratefied by reason for reoperation varies widely depending on the study

DEPARTMENT OF SURGERY
MEDICAL UNIVERSITY OF VIENNA
Division of General Surgery

Thank you for your attention

G. Prager
F. Langer
C. Bichler
M. Felsenreich
M. Mairinger
J. Jedamzik
J. Eichelter
L. Nixdorf
L. Gensthaler
P. Richwien

B. Dreschl
T. Leitner

E. Freundorfer
B. Gober

S. Traussnig
M. Krebs
F. Kiefer
B. Itariu
M. Luger
T. Stulnig

E. Fleischmann
T. Hamp