

UNKNOWN UNKNOWNNS IN MBS

WHAT DO WE **NOT** KNOW IN ONE-ANASTOMOSIS GASTRIC BYPASS?



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XXIX IFSO
World Congress

1-4 September 2026 | Toronto, Canada



TORONTO2026

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

Disclosures



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Speaker Fees



Educational Grant



Educational Grant
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Educational Grant
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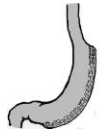


Advisory Board

Evolution of MBS at the Medical University of Vienna



1996 lap. Gastric Banding



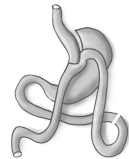
2002 lap. Sleeve Gastrectomy



2003 lap. Y-Roux Gastric Bypass



2009 lap. BPD



2010 lap. OAGB



2016 SADI-S

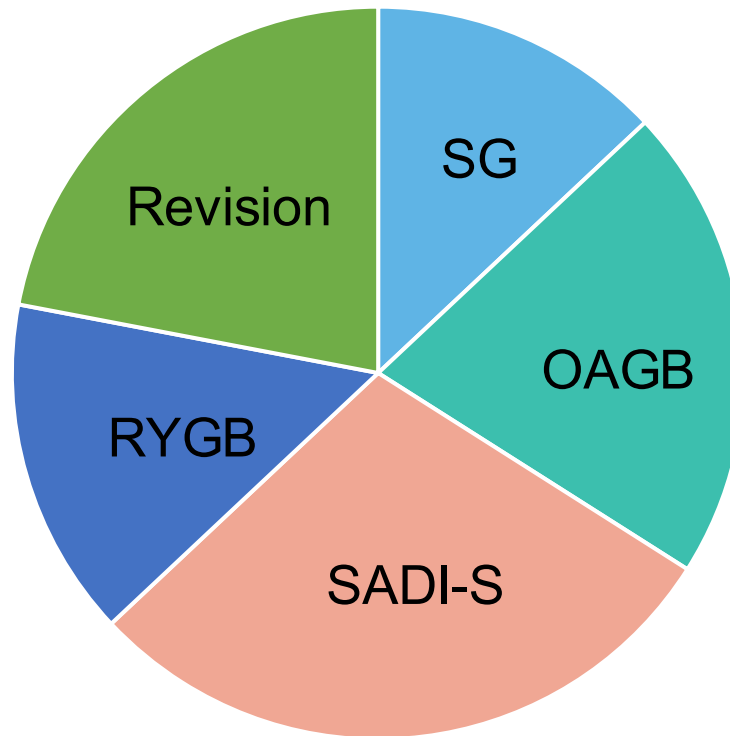


2023 Robotic MBS



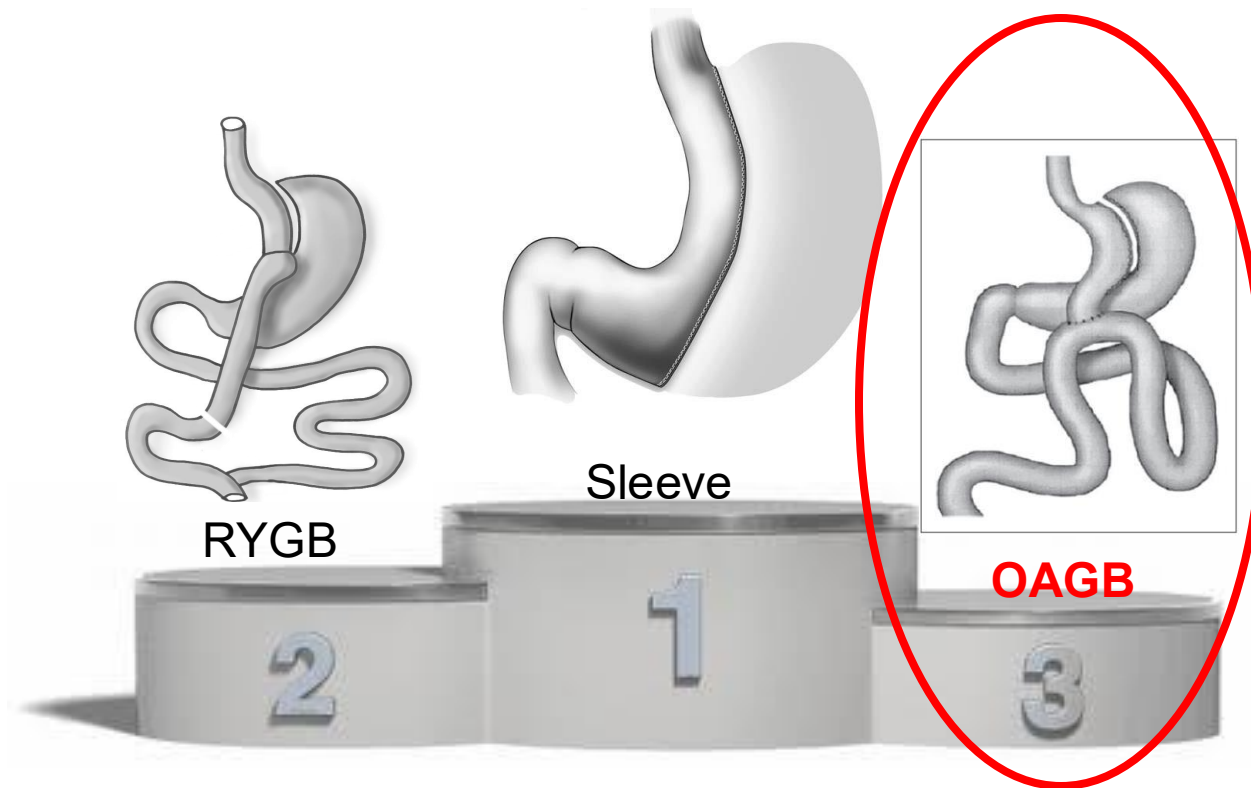
2024 ESG/TORE

Case mix



LAGB	0%
SG	13%
RYGB	20%
OAGB	21%
SADI-S	26%
Revision	20%

Most Common bariatric procedures worldwide:



THREE QUESTIONS

1

How much bowel should we bypass?

2

What are the consequences of decades of bile exposure?

3

Are we even measuring the right things?



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

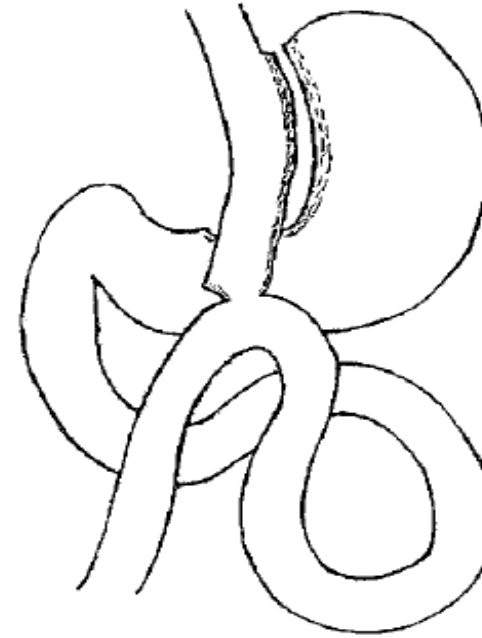
Prospective consecutive case series

89% women

Follow-up: 89%

Mean EWL (mean BMI: 47 kg/m²)

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

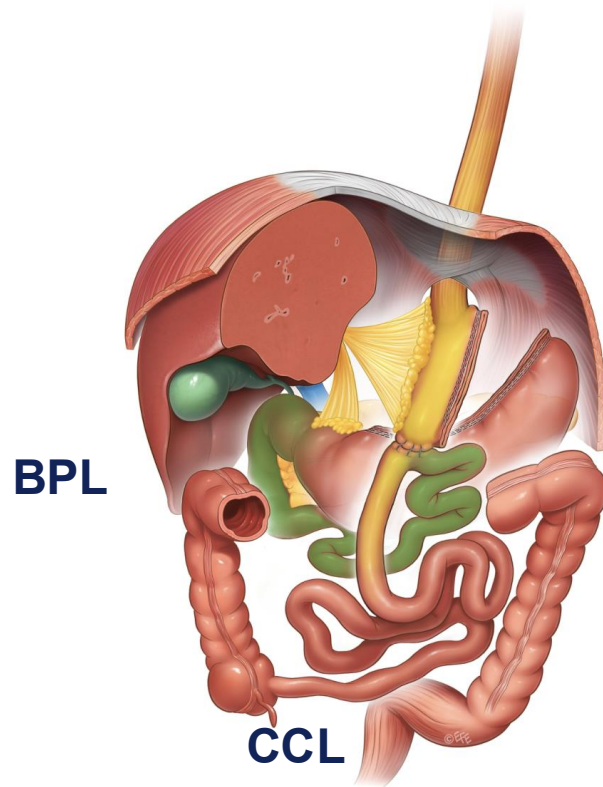


app.200cm

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

1. OPTIMAL LIMB LENGTH

150 or 200 cm ... of what?



- Fixed biliopancreatic limb (BPL): usually 150–200 cm
- Total small-bowel length varies widely
- Same 200 cm $\neq$ same physiological bypass
- Common channel (CCL) is rarely measured

Salman et al. Obes Surg. 2023;33:1846–1856.

Original article

Bowel length: measurement, predictors, and impact on bariatric and metabolic surgery

Roberto M. Tacchino, M.D.*

Department of Surgery, Catholic University of the Sacred Heart, Rome, Italy

Received May 9, 2014; accepted September 11, 2014

N=443

3 different measurement methods (Laparotomy, Laparoscopy)

SBL was 690 $\pm$ 93.7 cm (range 350–1049 cm)

Men > Women (729 $\pm$ 85cm versus 678 $\pm$ 92cm , P<0.0001)

SBL correlation with height

Small bowel length and its correlations in historical series

Author	Number of cases	C/L	Sex	SBL		Correlation with			
				Minimum	Average	Maximum	Age	Height	Weight
Treves (1885) (4)	100	C	M	472	686	970	NO	NO	NO
			F	574	711	894	NO	NO	NO
Dreike (1894) (5)	27	C	M	421	633	1013			
	23		F	340	526	856			
Bryant (1924) (6)	160	C	Both	305	625	864	Negative correlation		
	27		M	457	663	813			
	17		F	406	587	762			
Underhill (1955) (7)	65	C	M	488	638	785	NO	YES	
	35		F	335	592	716			
Backman (1974) (8)		C	Obese M	455	824	1193			
			Obese F	497	734	971			
			Non-obese M	365	698	1031			
			Non-obese F	361	616	871			
Guzman (1977) (9)	56	L	Obese	253	562	871			
	22		Non-obese	201	530	813			
Nordgreen (1997)(10)	40	L	M	380	591	1090	NO	YES	YES
	37		F	360	534	740	NO	YES	YES
Hounnou (2002) (11)	100	C	M	365	644	1000	Negative correlation	NO	YES
	100		F	280	573	840	Negative correlation	NO	YES
Hosseinpour (2008) (12)	54	L	M	285	459	619	NO	NO	N
	46		F	308	468	620			
Teitelbaum (2013) (13)	240	L	(113 M + 127 F)	285	506	845	NO	YES	NO

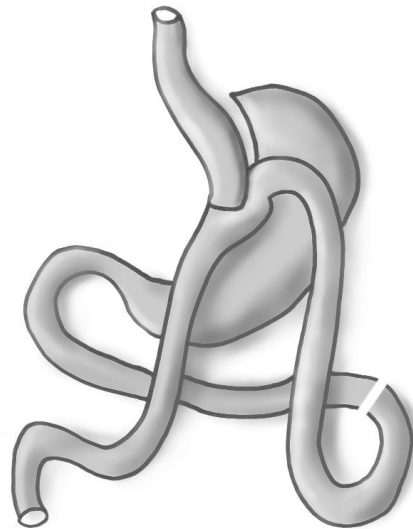
SBL = small bowel length (cm); C = cadaver data; M = males; F = females; L = live patient data

Laparoscopic Mini-gastric Bypass: Experience with Tailored Bypass Limb According to Body Weight

Wei-Jei Lee • Weu Wang • Yi-Chih Lee •
Ming-Te Huang • Kong-Han Ser • Jung-Chien Chen

OBES SURG (2008) 18:294–299

Tailored limb approach
644 pat.



3 BMI Groups (pat.)	limb	mean BMI↓
– <40 (286)	150cm	10,7
– 40-50 (286)	250cm	15,5
– >50 (72)	350cm	23,3

Conclusion:

Tailored limb is feasible - Careful application in lower BMI

15-year experience of laparoscopic single anastomosis (mini-)gastric bypass: comparison with other bariatric procedures

Nawaf Alkhalifah^{1,2} · Wei-Jei Lee¹ · Tan Chun Hai^{1,3} · Kong-Han Ser¹ · Jung-Chien Chen¹ · Chun-Chi Wu¹

Received: 13 July 2017 / Accepted: 13 December 2017

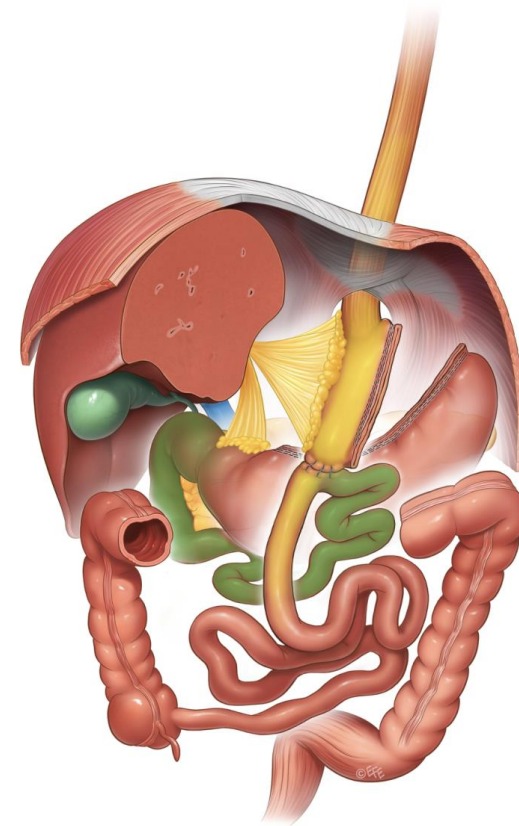
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1731 OAGB/MGB performed
Follow up after 10a: 43.6%
52.1% Follow up after 5a

BPL 150–250 cm according to BMI
AL minimum 400cm, entire bowel measured

Revision rate: 4.0% (70/1731)
Malnutrition: 2.5% (43/1731)

Revision should be: 9.3% (70/755 (43.6%))
Malnutrition in 43p (43/755) = 5.7%!



MGB-OAGB: Effect of Biliopancreatic Limb Length on Nutritional Deficiency, Weight Loss, and Comorbidity Resolution

Anmol Ahuja¹ • Om Tantia¹  • Ghanshyam Goyal¹ • Tamonas Chaudhuri¹ • Shashi Khanna¹ • Anshuman Poddar¹ • Sonam Gupta¹ • Kajari Majumdar¹

101 patients, divided into 3 groups

BPL 150cm	n=32
BPL 180cm	n=49
BPL 250cm	n=20

1 year Follow up



MGB-OAGB: Effect of Biliopancreatic Limb Length on Nutritional Deficiency, Weight Loss, and Comorbidity Resolution

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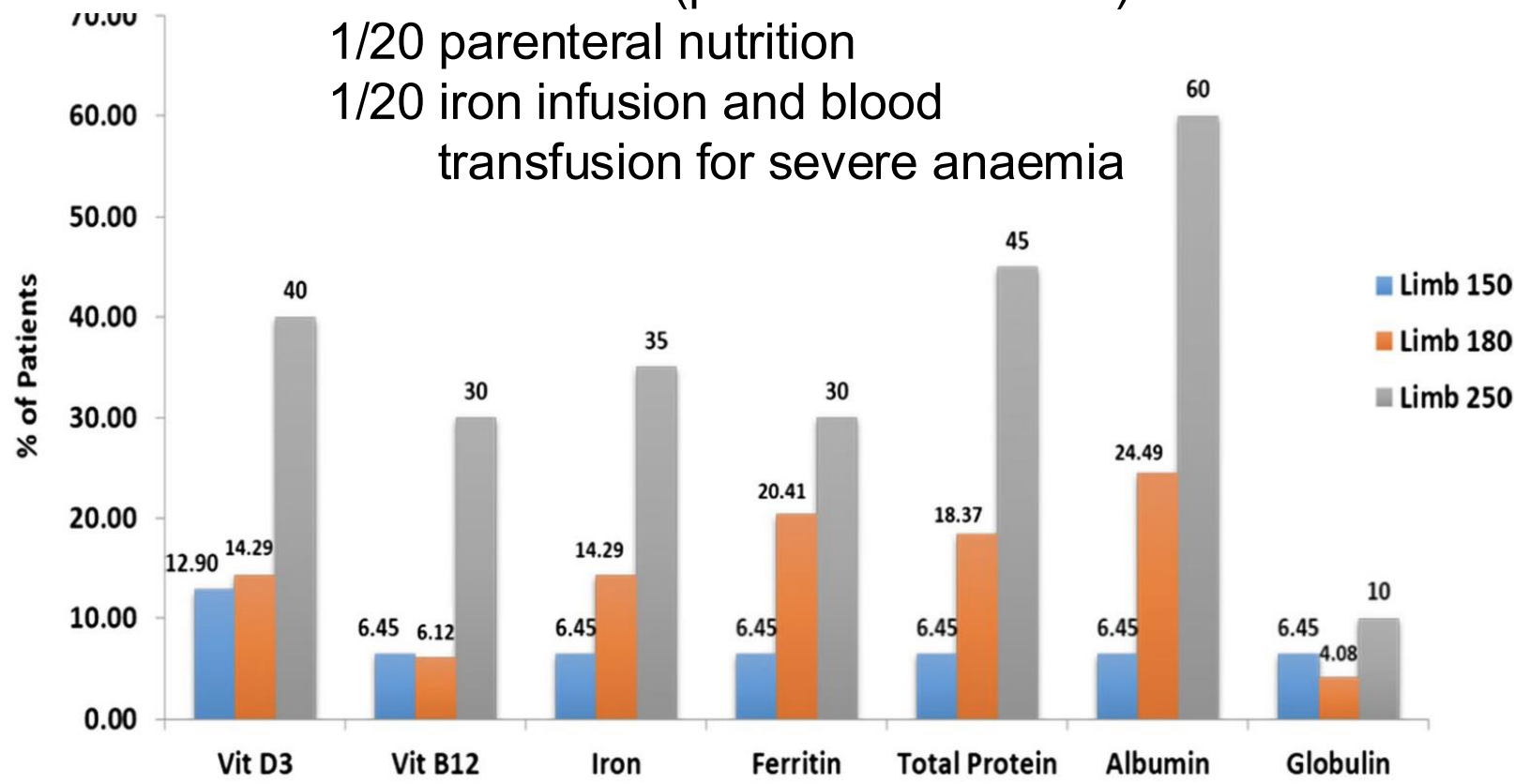
BPL 150cm	n=32
BPL 180cm	n=49
BPL 250cm	n=20

1 year Follow up

Ahuja A et al., Obes Surg 2018

250cm group:

1/20 late death (protein malnutrition)
1/20 parenteral nutrition
1/20 iron infusion and blood transfusion for severe anaemia



Percentage of patients with nutritional deficiencies in 150 cm, 180 cm & 250 cm groups.



One Anastomosis Gastric Bypass–Mini Gastric Bypass with Tailored Biliopancreatic Limb Length Formula Relative to Small Bowel Length: Preliminary Results

Iman Komaei¹ • Federica Sarra¹ • Claudio Lazzara¹ • Michele Ammendola² • Riccardo Memeo³ • Giuseppe Sammarco² • Giuseppe Navarra¹ • Giuseppe Currò^{1,2}

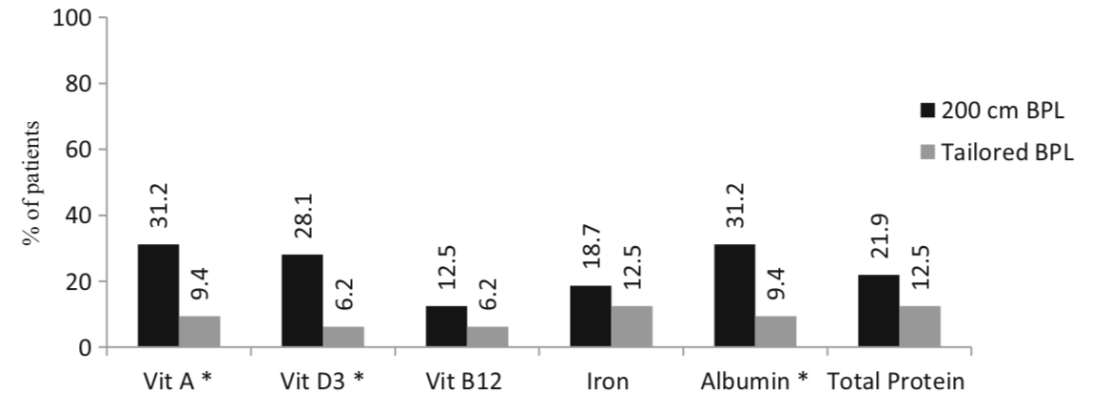
64 patients in 2 groups

- Fixed BPL 200cm
- **Tailored BPL 40% of TSB**

No difference in weight loss between groups (1a Follow up)

Significantly **less Vitamin A, D and Albumin deficiencies** for tailored BPL length

No difference in Iron deficiency



Percentage of patients with nutritional deficiencies in 200 cm BPL and tailored BPL lengths

Komaei et al., Obes Surg 2019

Effect of tailoring biliopancreatic limb length based on total small bowel length *versus* standard limb length in one anastomosis gastric bypass: 1-year outcomes of the TAILOR randomized clinical superiority trial

Nienke Slagter^{1,2,3,4,*}, Lindsay van der Laan^{1,2,3,4}, Loek J. M. de Heide^{1,2}, Ewoud H. Jutte^{1,2}, Mirjam A. Kaijser^{1,2}, Stefan L. Damen^{1,2}, André P. van Beek^{3,4} and Marloes Emous^{1,2}

RCT

105 patients were randomized into the standard biliopancreatic limb group (150cm)
 107 patients into the tailored biliopancreatic limb group

TSBL <500 cm:	BPL 150 cm
TSBL 500–700cm:	BPL 180 cm
TSBL >700 cm:	BPL 210 cm.

1a after surgery, it is not superior to a standard BPL of 150 cm in terms of %TWL

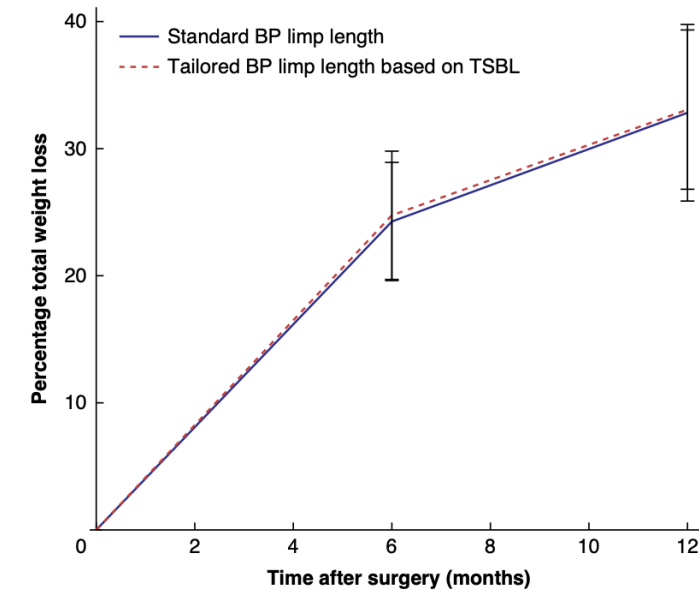


Fig. 2 Percentage total weight loss during the first year after surgery
 Values are mean(s.d.). BP, biliopancreatic; TSBL, total small bowel length.

N. Slagter et al. BJS 2024

150 CM VS 200 CM – WHAT DOES THE EVIDENCE SAY?

150 cm BPL

Similar %TWL up to 5 years
(no clinically relevant difference)

Lower risk of hypoalbuminemia,
folate deficiency and ferritin deficiency

Similar remission of
DM2, HTN, dyslipidemia

200 cm BPL

Slightly higher %TWL
(pooled difference ~2–3%)

Higher rates of ferritin and
folate deficiency

No significant advantage

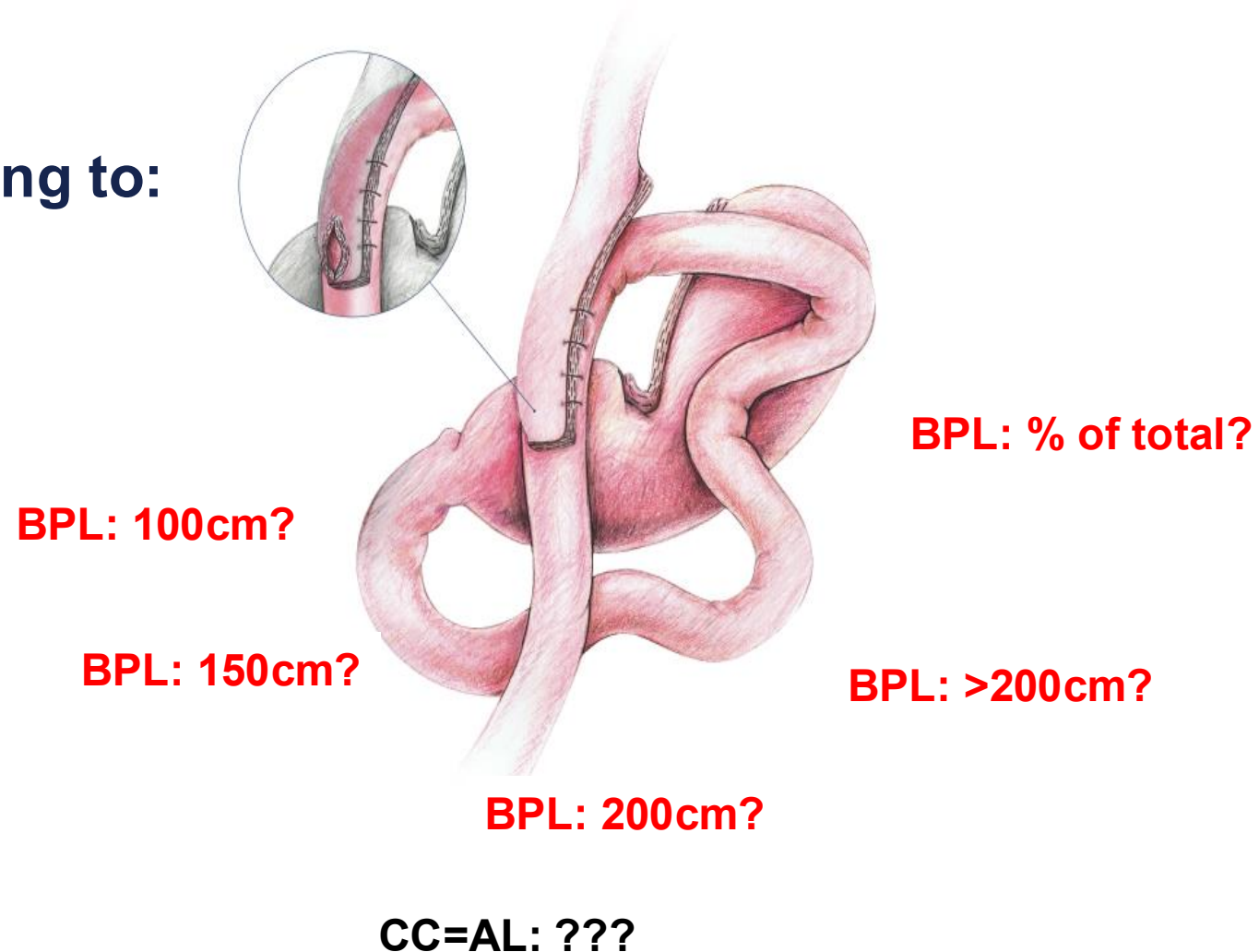
Salman et al. Obes Surg. 2023;33:1846–1856.



MAYBE CENTIMETERS ARE THE WRONG METRIC

Should OAGB be tailored according to:

- Total small-bowel length?
- Percentage of bowel bypassed?
- Common channel length?
- BMI and metabolic phenotype?
- Age / sarcopenia risk?



Research starts here

Yes, tailoring BPL to TSBL appears to reduce malnutrition, though long-term RCT data is pending.

Does tailoring biliopancreatic limb length to total small bowel length improve long-term malnutrition rates?

N = 9



- Yes 44% 
- Possibly 22%
- Mixed 0%
- No 33%   

All details 

Are There Ideal Small Bowel Limb Lengths for One-Anastomosis Gastric Bypass (OAGB) to Obtain Optimal Weight Loss and Remission of Comorbidities with Minimal Nutritional Deficiencies?

Jaime Ruiz-Tovar¹ · Miguel A. Carbajo¹ · Jose M. Jimenez¹ · Enrique Luque-de-Leon¹ ·
Javier Ortiz-de-Solorzano¹ · Maria J. Castro¹

An ideal range was established between 0.40 and 0.43 for the CL/TBL ratio, and **200 to 220 cm for the CL length.**

Among these ranges, there were **no cases of protein or calorie malnutrition**

World J Surg (2020) 44:855–862



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

Jaime Ruiz-Tovar^{1,2}  · Miguel Angel Carbaio¹ · Jose Maria Jimenez¹ · Maria Jose Castro¹ · Gilberto Gonzalez¹ · Javier Ortiz-de-Solorzano¹ · Lorea Zubiaga^{1,2}

Received: 28 March 2018 / Accepted: 18 June 2018
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- Single center RCT: 600p: 200 OAGB/200 RYGB/ 200 SG
- Follow up after 5 years: **>90%**
- OAGB > RYGB in EWL (**97.7** vs. 77.1%), Diabetes remission, HT, DL

Ruiz-Tovar et al, Surg Endoscopy 2018



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

**...if it sounds too good
to be true...**

Jaime Ruiz-Tovar^{1,2} · Miguel Angel Carbaio¹ · José María Jimenez¹ · María José Castro¹ · Gilberto Gonzalez¹ ·
Javier Ortiz-de-Solorzano¹ · Lorea Zambudio¹

Received: 28 March 2018 / Accepted: 18 June 2018
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...it might not be true...

- Single-center RCT; 6 years; 200 OAGB/200 RYGB/200 SG
Follow up after 5 years: >90%
- OAGB > RYGB in EWL (**97.7** vs. 77.1%), Diabetes remission, HT, DL

Ruiz-Tovar et al, Surg Endoscopy 2018

But always keep in mind to ...



THREE QUESTIONS

1

How much bowel should we bypass?

2

What are the consequences of decades of bile exposure?

3

Are we even measuring the right things?



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)

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

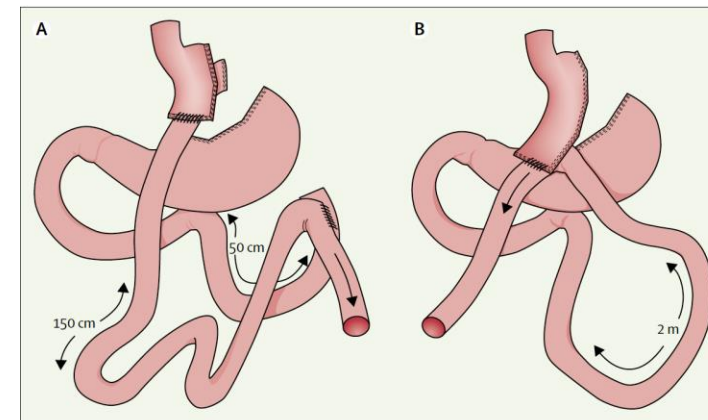


Figure 1: Roux-en-Y gastric bypass (A) and one anastomosis gastric bypass (B) surgical procedures

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

2. BILE REFLUX – WE KNOW IT EXISTS

48%

Bile in the pouch

34%

Esophagitis

6%

Barrett's esophagus

- 38% anastomosis
- Acid reflux ↓
- Non-acid reflux ↑
- Abnormalities occurred even in asymptomatic patients

Felsenreich et al. Obes Surg. 2025;35:1285–1294.

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 malnutrition
- 3 weight regain

Jedamzik et al, SOARD 2022

FROM BILE TO CANCER: SIGNAL VS. PROOF

THE SIGNAL

- Bile reflux is common
- Chronic inflammation documented
- Esophagitis / Barrett reported
- Case reports of gastric and esophageal cancer



WHAT WE DO NOT KNOW

- True incidence of dysplasia
- True incidence of cancer
- Causal relationship
- Impact after 20–40 years

Cancer is a latency problem

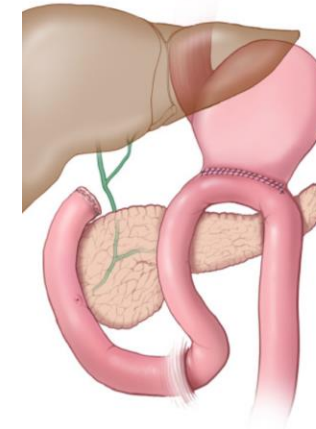
Menahen et al. Surg Obes Relat Dis. 2023;19:1528–1541.

The Risk of Gastric Carcinoma after Surgical Treatment for Benign Ulcer Disease — A Population-Based Study in Olmsted County, Minnesota

Authors: Larry W. Schafer, M.D., David E. Larson, M.D., L. Joseph Melton, III, M.D., John A. Higgins, M.D., and Duane M. Ilstrup, M.S. [Author Info & Affiliations](#)



The NEW ENGLAND
JOURNAL of MEDICINE



Does Bile in the Stomach result in Carcinoma?

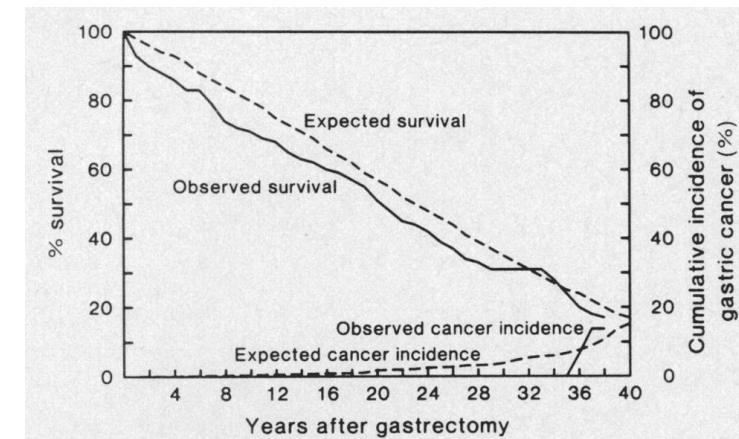
Mayo Clinic Group:

338 patients who had surgery for

ulcer disease 1935-1959

(5635 person years, Follow up of 25 years!)

→ NO increase in Gastric Carcinoma



Does Bile in the Stomach result in Carcinoma?

NO increase in Gastric Carcinoma after Billroth II

Bassily R, Smallwood RA, Crotty B. Risk of gastric cancer is not increased after partial gastrectomy. J Gastroenterol Hepatol 2000; 15: 762-5.

Luukkonen P, Kalima T, Kivilaako E. Decreased risk of gastric stump carcinoma after partial gastrectomy. Hepatogastroenterol 1990; 37: 392-4.

Clark CG, Fresni A, Gledhill T et al. Cancer following gastric surgery. Br J Surg 1985; 72: 591-4.

Gastroesophageal Cancer After Gastric Bypass Surgeries: a Systematic Review and Meta-analysis

Rodrigue Chemaly^{1,2} · Samer Diab¹ · Georges Khazen³ · Georges Al-Hajj^{1,2}

Type of surgery	RYGB	LGB-OAGB/MGB
Number of cases	44	8
Mean age (y) (mean ± SD)	56.1 ± 10.3	55 ± 11.4
Sex ratio (F/M)	20/24	6/2
Date of occurrence (mean ± SD)	Years: 9.16 ± 87 Months: 113 ± 104	Years: 13.1 ± 9.83 Months: 157 ± 120
Site of occurrence	Excluded stomach: 17 Gastric tube: 27	Excluded stomach: 5 Gastric tube: 3
Type of diagnosis	Gastroscopy: 30 Other: 14	Gastroscopy: 3 Other: 5

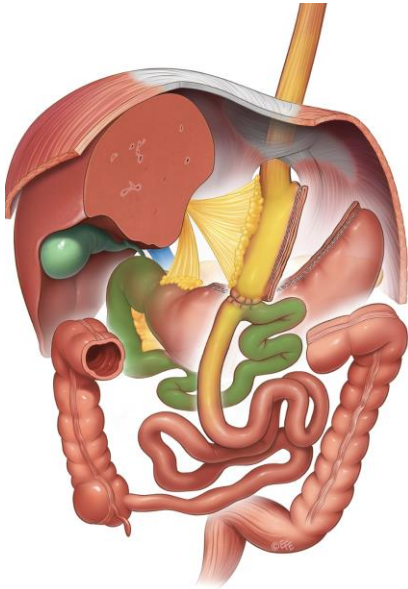
52 cancers (adenocarcinoma) after RYGB/OAGB

RYGB 61% (27/44) of the cancers in the gastric tube
OAGB 37.5% (3/8) of the cancers in the gastric tube

→ Majority of reported cancers after
OAGB in the GASTRIC REMNANT!

Obesity Surgery (2022) 32:1300–1311

The OAGB is different from the Mason Loop GBP or Billroth 2

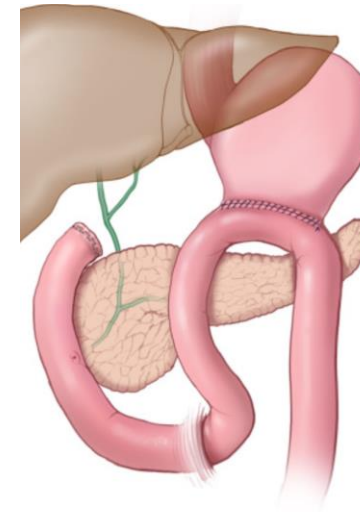


OAGB



Figure 6. 1967 Mason and Ito: Gastric bypass: gastric transection with loop gastrojejunostomy.

Mason Loop GB

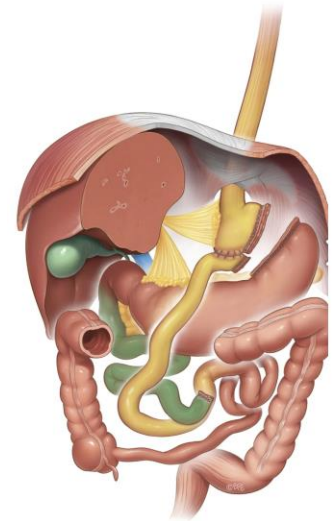


Billroth 2



Cancer in the Excluded Stomach After Gastric Bypass Surgery for Obesity

Leijonmarck, Wilhelm MD PhD¹ ; Santoni, Giola PhD¹; Holmberg, Dag MD PhD¹; von Euler-Chelpin, My PhD²; Ness-Jensen, Eivind MD PhD⁴; Kauppila, Joonas H. MD PhD⁵; Lagergren, Jesper MD PhD⁶ 



82394 RYGB

Gastric bypass was associated with an increased risk of gastric non-cardia adenocarcinoma between 10-44 years after surgery (HR=4.0, 95%-CI 1.2-13.7; SIR=2.5, 95%-CI 1.4-5.0),

Gastric bypass might increase the risk of adenocarcinoma in the excluded stomach and delay the detection when such tumors occur.

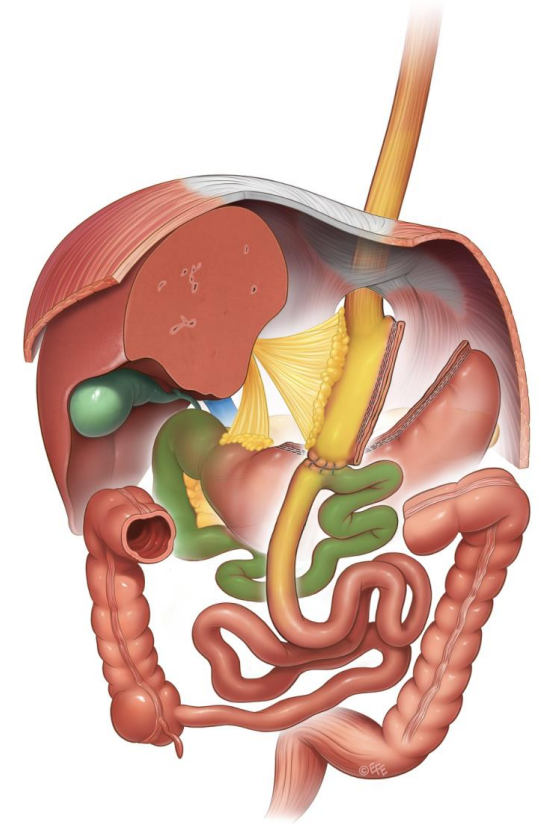
Yet, this cancer is still rare after gastric bypass

A possible mechanism behind an increased risk of gastric non-cardia adenocarcinoma after gastric bypass is **duodenogastric reflux and stagnation of bile** and pancreatic juice in the excluded stomach.

Annals of Surgery, February 20, 2026

TAKE-HOME MESSAGES

- 1 We do not know how much bowel we should bypass.
150 or 200 cm of what? Tailoring by physiology,
not dogma, is the future.
- 2 Bile reflux after OAGB is real.
But the consequences after 20–40 years,
including cancer risk - remain unknown.
- 3 Perhaps our biggest unknown is caused by
measuring the wrong things.
We need the right metrics, registries and time.



OAGB works remarkably well - our understanding is still incomplete.

XXX IFSO WORLD CONGRESS

"Advancing Multimodal Obesity Care"

24-27 August 2027

ifso2027.org



See you in
PARIS



MEDICAL UNIVERSITY
OF VIENNA









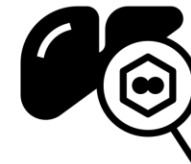
ORIGINAL CONTRIBUTIONS

Significant Liver-Related Morbidity After Bariatric Surgery and Its Reversal—a Case Series

Magdalena Eilenberg¹ • Felix B. Langer¹ • Andrea Beer² • Michael Trauner³ •
Gerhard Prager¹ • Katharina Staufer⁴ 

5 patients after OAGB:

Liver dysfunction developed after a median interval of 15 months (range 2–88 months)



	BPL	AL	BPL/AL %	%EWL	action	Time to onset (months)
1	175	500	26:74	125.4	LTX	5
2	370	320	54:46	123.7	RYGB*	12
3	265	395	40:60	120.7	RYGB*	35
4	200	375	35:65	107.8	RYGB*	36
5	95	275	25:75	85.9	RYGB*	20

*lengthening of the CC

Elongation of the resorption length of the bypass has led to an improvement in symptoms in **all patients**.

Eilenberg et al., Obes Surg 2018



Long-Term Results of One Anastomosis Gastric Bypass: a Single Center Experience with a Minimum Follow-Up of 10 Years

Sergio Carandina ^{1 2 3}, Antoine Soprani ⁴, Viola Zulian ⁵, Jean Cady ⁴

385 patients

Long Term Complications:

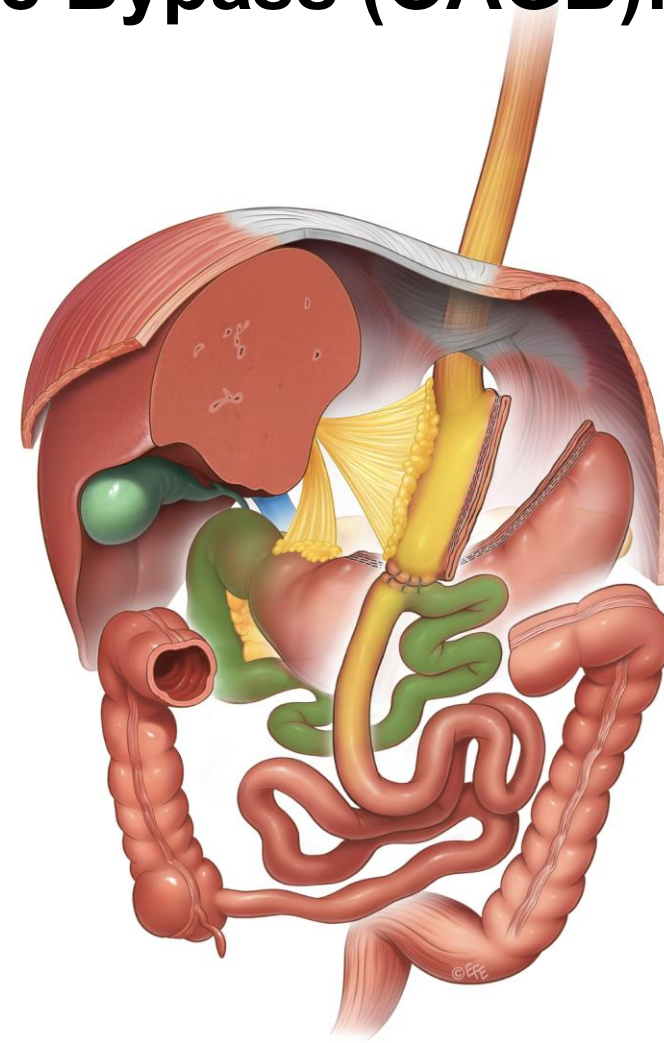
ulcer at the gastrojejunal anastomosis level. 4.9%
major **malnutrition** 2.3%
postoperative biliary reflux 9.8%
severe **anemia** 2.7%

Obes Surg 2021 Aug;31(8):3468-3475

One Anastomosis Gastric Bypass (OAGB):

Some surgeons claim that there is LESS reflux after OAGB...

Is it true?





Functional testing in OAGB

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. Felsenreich¹ · M. L. Zach¹ · N. Vock¹ · J. Jedamzik¹ · J. Eichelter¹ · M. Mairinger¹ · L. Gensthaler¹ · L. Nixdorf¹ · P. Richwien² · C. Bichler¹ · I. Kristo¹ · F. B. Langer¹ · G. Prager¹

24h-pH-metry:

All patients			
	Basis OAGB (<i>n</i> = 21)	Follow-up (<i>n</i> = 21)	<i>p</i> -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



Functional testing in OAGB

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. Felsenreich¹ · M. L. Zach¹ · N. Vock¹ · J. Jedamzik¹ · J. Eichelter¹ · M. Mairinger¹ · L. Gensthaler¹ · L. Nixdorf¹ · P. Richwien² · C. Bichler¹ · I. Kristo¹ · F. B. Langer¹ · G. Prager¹

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



Functional testing in OAGB

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24h-pH-metry:

All patients			
	Basis OAGB (<i>n</i> = 21)	Follow-up (<i>n</i> = 21)	<i>p</i> -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
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Felsenreich D.M. et al., Surg Endo 2023

How to detect Bile reflux?

1. Listen to the patient!

WHEN does it occur?

Eating pattern?

→Lifestyle modification

2. Upper GI Endoscopy!

3. pH Metry

Acid reflux

Non-Acid reflux

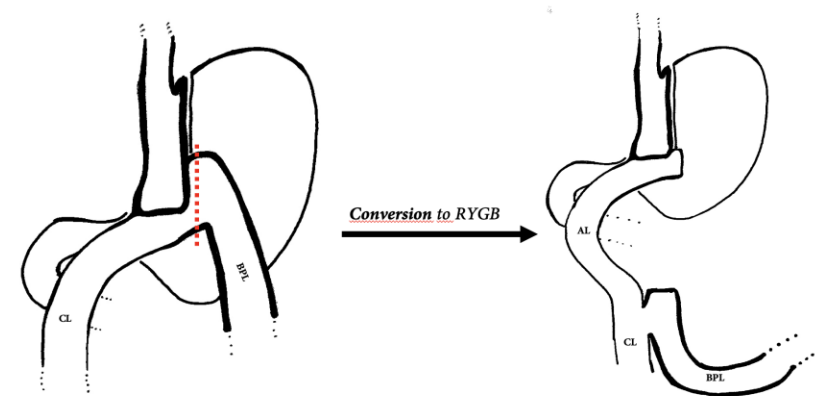
Treatment Options of Bile Reflux after OAGB:

- 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



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



A letter to the editor was written
signed by numerous IFSO-members ...

Daniel M Felsenreich

Felix B Langer

Jacques Himpens

Marco Bueter

Scott A Shikora

Martin Fried

Michel Suter

Luigi Angrisani

Ralph Peterli

Torsten Olbers

Ronald Liem

Antonio J Torres

Paulina Salminen

Jean-Marc Chevallier

Almino Ramos

Lilian Kow

Nicola Di Lorenzo

Gerhard Prager

After more than 6 months Surgical Endoscopy retracted the paper...

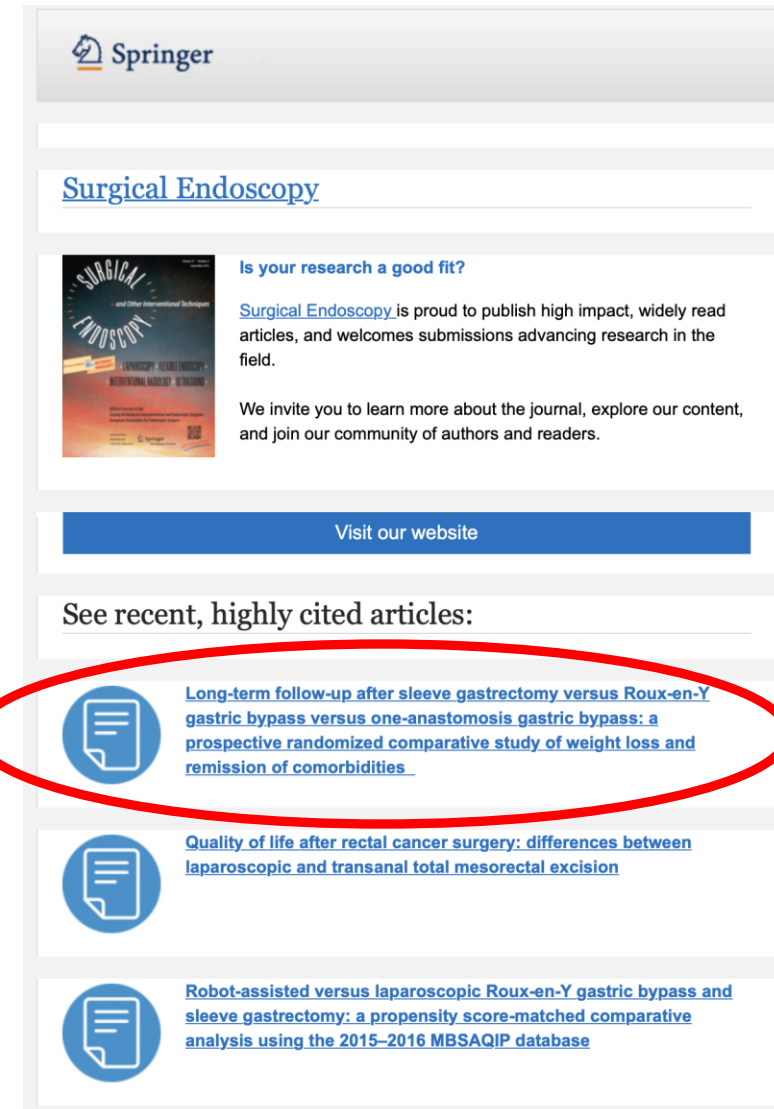
Dear Professor Gerhard,

We discussed this article in the editorial board today after receiving the reply from all authors. **The article will be formally retracted.**

We note your comments about data. The governance of data generated by authors lies within the employing institutions.

All the best,

George



Springer

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-  [Robot-assisted versus laparoscopic Roux-en-Y gastric bypass and sleeve gastrectomy: a propensity score-matched comparative analysis using the 2015–2016 MBSAQIP database](#)

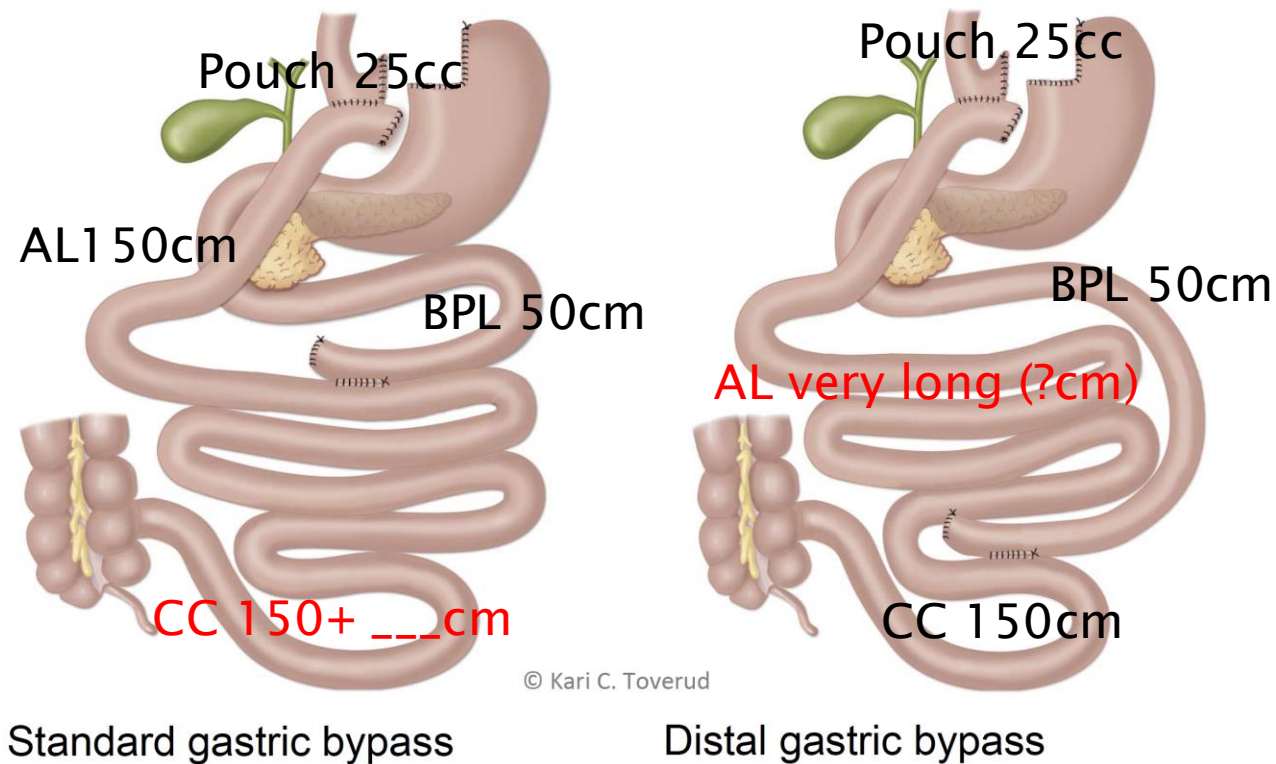




Standard vs Distal Roux-en-Y Gastric Bypass in Patients With Body Mass Index 50 to 60

A Double-blind, Randomized Clinical Trial

Hilde Ristad, MD; Marius Svanevik, MD; Jon A. Kristinsson, MD, PhD; Jøran Hjelmæsæth, 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



© Kari C. Toverud

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

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double-blind, randomized clinical trial
113 patients with a body mass index of 50 to 60kg/m²
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**

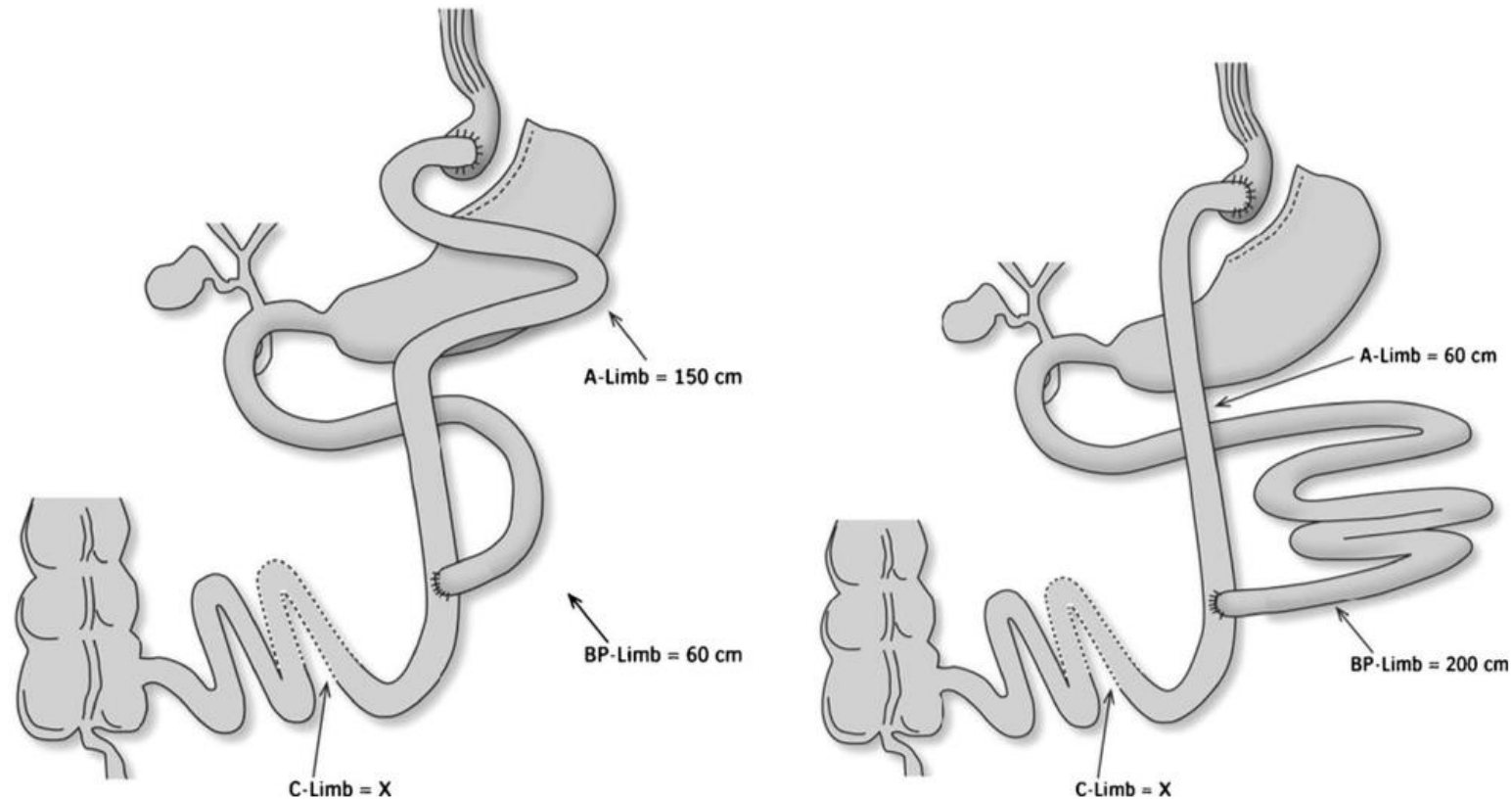
prospective randomized study

187 patients

5 years 85% FU

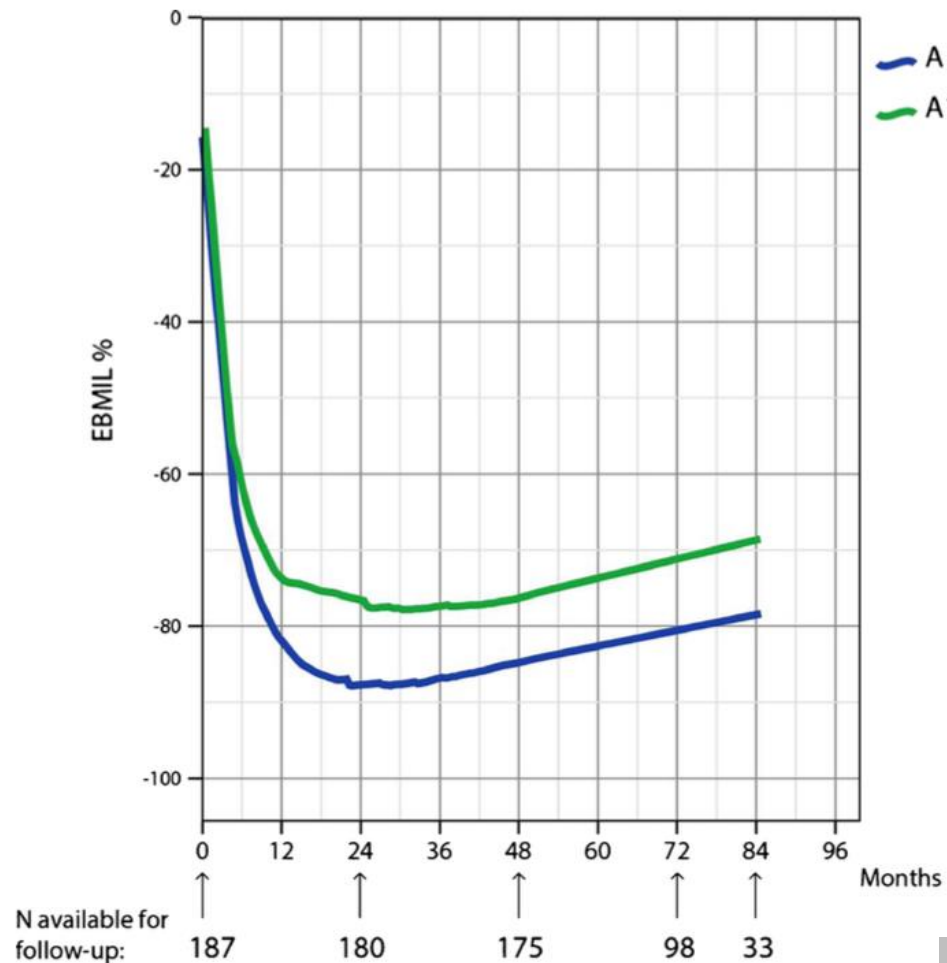
Nergaard et al. Obes Surg 2014: 1595

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

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

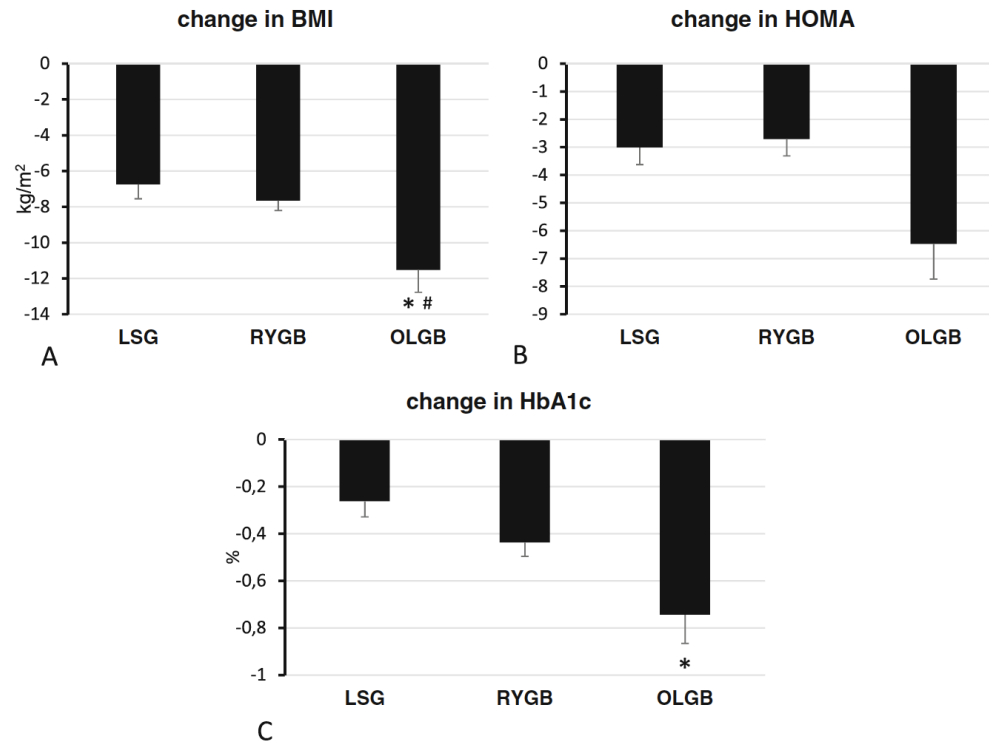


Nergaard et al. Obes Surg 2014: 1595



Evidence That the Length of Bile Loop Determines Serum Bile Acid Concentration and Glycemic Control After Bariatric Surgery

Adriana Mika^{1,2} • Lukasz Kaska³ • Monika Proczko-Stepaniak³ • Agnieszka Chomiczewska¹ • Julian Swierczynski^{4,5} • Ryszard T Smolenski⁴ • Tomasz Sledzinski¹



Longer BPL:

Better weight Loss
Better Diabetes Control

OBES SURG (2018) 28:3405–3414



Evidence That the Length of Bile Loop Determines Serum Bile Acid Concentration and Glycemic Control After Bariatric Surgery

Adriana Mika^{1,2} • Lukasz Kaska³ • Monika Proczko-Stepaniak³ • Agnieszka Chomiczewska¹ • Julian Swierczynski^{4,5} • Ryszard T Smolenski⁴ • Tomasz Sledzinski¹

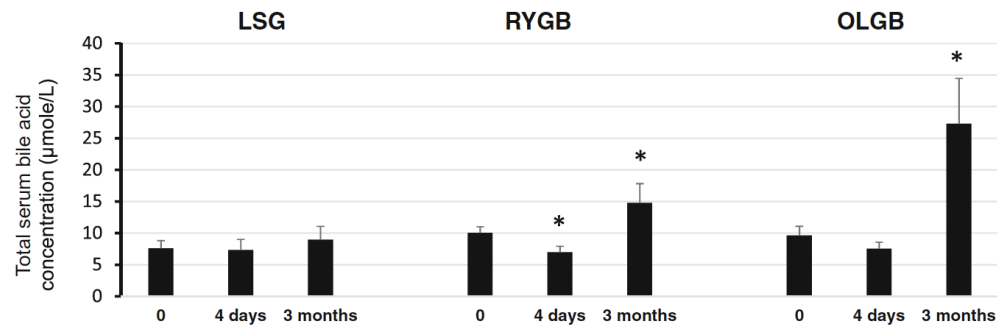
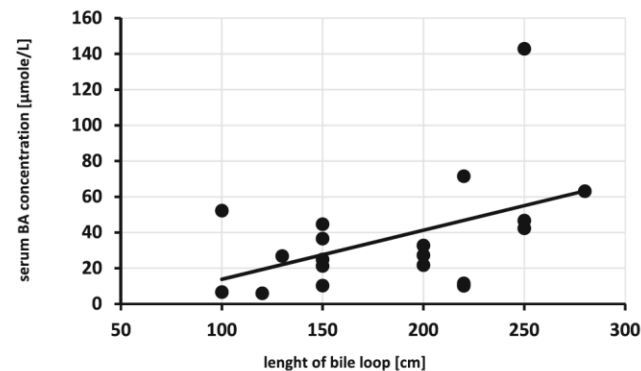


Fig. 4 Correlation between the length of bile loop created during RYGB and OLGB and serum concentration of total bile acids determined 3 months after the bariatric procedure. $R = 0.47$, $p < 0.05$



Longer BPL:

Higher BA concentration

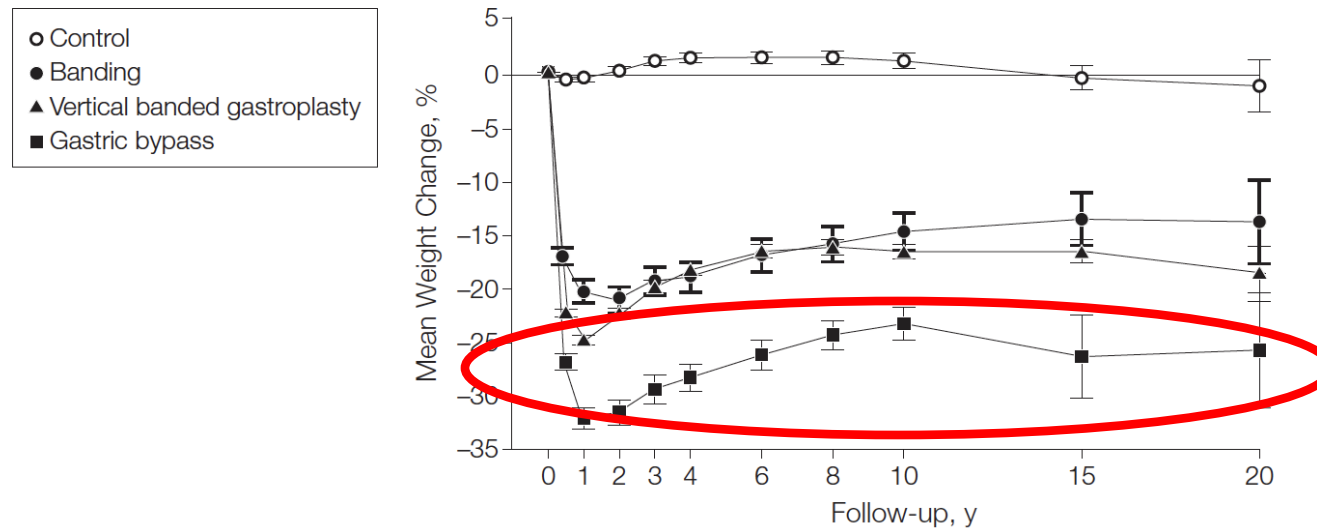
BA conc. correlates with BPL length

OBES SURG (2018) 28:3405–3414



Long Term Weight Loss – SOS Study

Figure 1. Mean Weight Change Percentages From Baseline for Controls and the 3 Surgery Groups Over 20 Years in the Swedish Obese Subjects Study



No. of patients						
Control	2037	1490	1242	1267	556	176
Banding	376	333	284	284	150	50
Vertical banded gastroplasty	1369	1086	987	1007	489	82
Gastric bypass	265	209	184	180	37	13

Carlson L et al. Lancet Diabetes Endocrinol. 2017 April ; 5(4): 271-279

2012;307(1):56-65

Sjöström L et al. JAMA. 2014;311(22):2297-2304

Sjöström et al. JAMA.



JAMA Surgery | **Original Investigation**

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

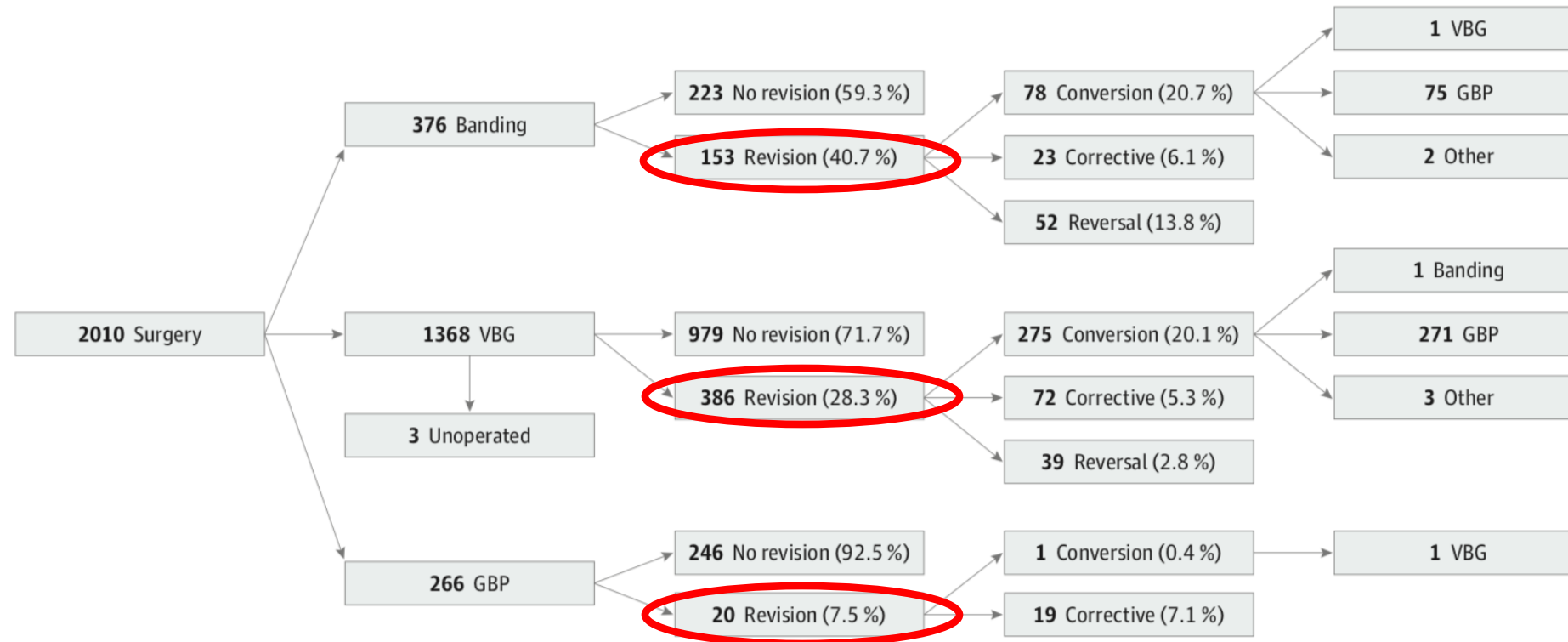
Stephan Hjorth, PhD; Ingmar Näslund, MD, PhD; Johanna C. Andersson-Assarsson, PhD; Per-Arne Svensson, PhD;
Peter Jacobson, MD, PhD; Markku Peltonen, PhD; Lena M. S. Carlsson, MD, PhD

JAMA Surg. 2019 Apr 1;154(4):319-326





Figure 1. Overview of SOS Surgery Cohort at Baseline (Index) and First-Time Revisional Surgery Follow-up Status in the Surgery Subgroups



The absolute numbers and percentages of index numbers in subgroups at baseline are shown. Other procedures include sleeve gastrectomy (including gastric plication), duodenal switch (including biliopancreatic diversion), and

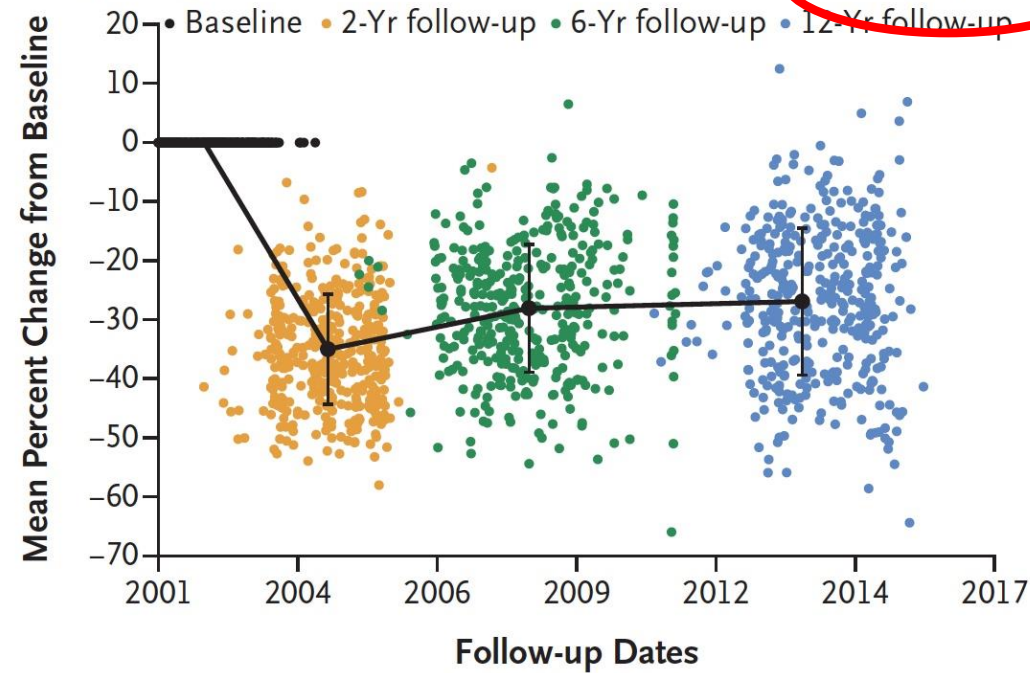
jejunoileal bypass. GBP indicates gastric bypass; VBG, vertical banded gastroplasty.

JAMA Surg. 2019 Apr 1;154(4):319-326



Weight and Metabolic Outcomes 12 Years after Gastric Bypass

A Mean Percent Change in Body Weight from Baseline to Years 2, 6, and 12 in the Surgery Group



No. of Patients	Baseline	2 Yr	6 Yr	12 Yr
Surgery group	418	409	379	387
Deaths	—	3	9	14
Total	418	412	388	401

Adams T. Et al., N Engl J Med 2017;377:1143-55.

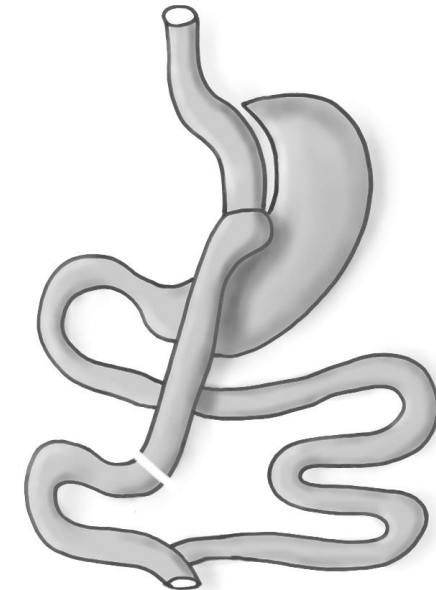


RYGB stood the test of time

Long term results show huge variations regarding
weight loss and reoperation-rate
Role of pouch-form/size and Limb-length?

Reasons for Reoperation:

Internal Hernia (2-10%)
unclear abdominal pain
Weight regain



Conversion of Proximal to Distal Gastric Bypass for Failed Gastric Bypass for Superobesity

Harvey J. Sugerman, M.D., John M. Kellum, M.D., Eric J. DeMaria, M.D.

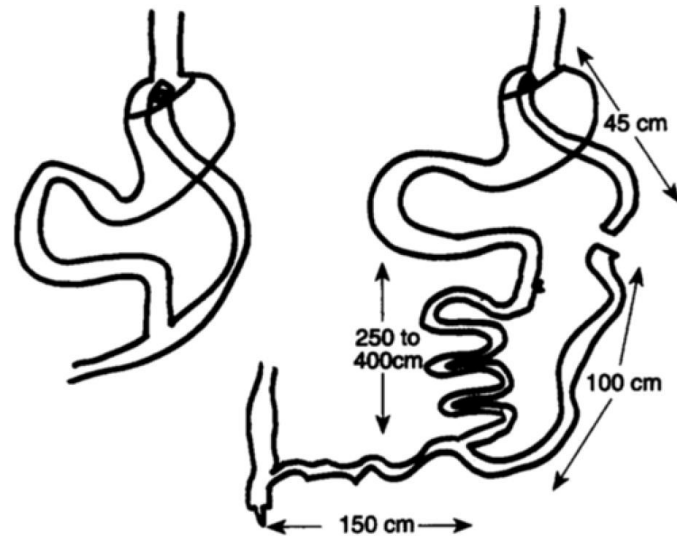


Fig. 1. Schematic of conversion of S-GBP to 150 cm D-GBP. Distal small bowel transected 250 cm from the ileocecal valve and proximal end anastomosed to the disconnected 45 cm Roux limb. Bypassed small bowel, or “biliopancreatic limb,” anastomosed to the ileum at 150 cm from the ileocecal valve. This creates a 145 cm “alimentary limb,” a 150 cm “common limb,” and a 250 to 400 cm “biliopancreatic limb.”

„Distal Gastric Bypass“:

5 patients **CC=50cm** AL=295cm
All had to be revised (**severe malnutrition**)
3 died due to liver failure

22 patients AL=145cm; **CC=150cm**
3 had to be revised (malnutrition)

Journal of Gastrointestinal Surgery 1999;1:517-525

Conversion of standard Roux-en-Y gastric bypass to distal bypass for weight loss failure and metabolic syndrome: 3-year follow-up and evolution of technique to reduce nutritional complications

Saber Ghiassi, M.D., M.P.H.^a, Kelvin Higa, M.D.^{b,*}, Steven Chang, M.D.^b, Pearl Ma, M.D.^b, Aaron Lloyd, M.P.H.^b, Keith Boone, M.D.^b, Eric J. DeMaria, M.D.^c

11 p total alimentary limb length (TALL) of 250 to 300cm
(7 had to be revised (malnutrition))

The subsequent 85 patients were converted to distal RYGB with **TALL 400 to 450cm** in a single-stage operation

Surgery for Obesity and Related Diseases 14(2018)554–561



Conversion of standard Roux-en-Y gastric bypass to distal bypass for weight loss failure and metabolic syndrome: 3-year follow-up and evolution of technique to reduce nutritional complications

Saber Ghiassi, M.D., M.P.H.^a, Kelvin Higa, M.D.^{b,*}, Steven Chang, M.D.^b, Pearl Ma, M.D.^b, Aaron Lloyd, M.P.H.^b, Keith Boone, M.D.^b, Eric J. DeMaria, M.D.^c

Diarrhea and protein calorie malnutrition with TALL of 250 to 300 cm,

whereas **TALL 400 to 450 cm demonstrated a lower incidence of nutritional issues,**

but the effect on calcium, parathyroid hormone, and the fat soluble vitamins A and D is **still a major concern**

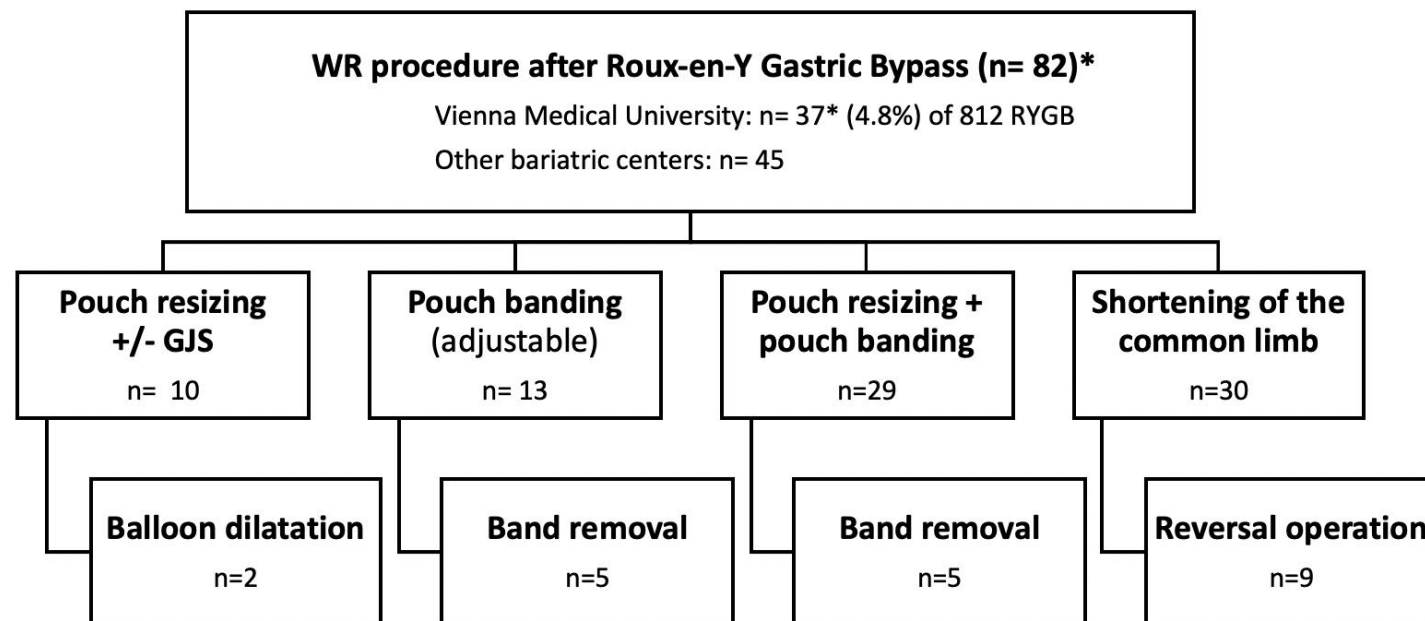
Surgery for Obesity and Related Diseases 14(2018)554–561



Original article

Surgical therapy of weight regain after Roux-en-Y gastric bypass

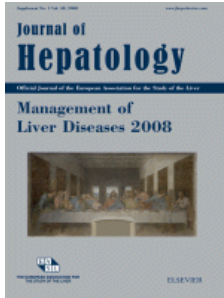
Daniel M. Felsenreich M.D.^a, Felix B. Langer M.D.^a, Christoph Bichler M.D.^a, Ivan Kristo M.D.^a, Julia Jedamzik M.D.^a, Magdalena Eilenberg M.D.^a, Michael A. Arnoldner M.D.^b, Gerhard Prager M.D.^a✉



Abbreviations: GJS: gastro-jejunostomy

* Two deceased patients were removed from this calculation.

SOARD Volume 15, Issue 10, October 2019, Pages 1719-1728



Hepatic histology in obese patients undergoing bariatric surgery

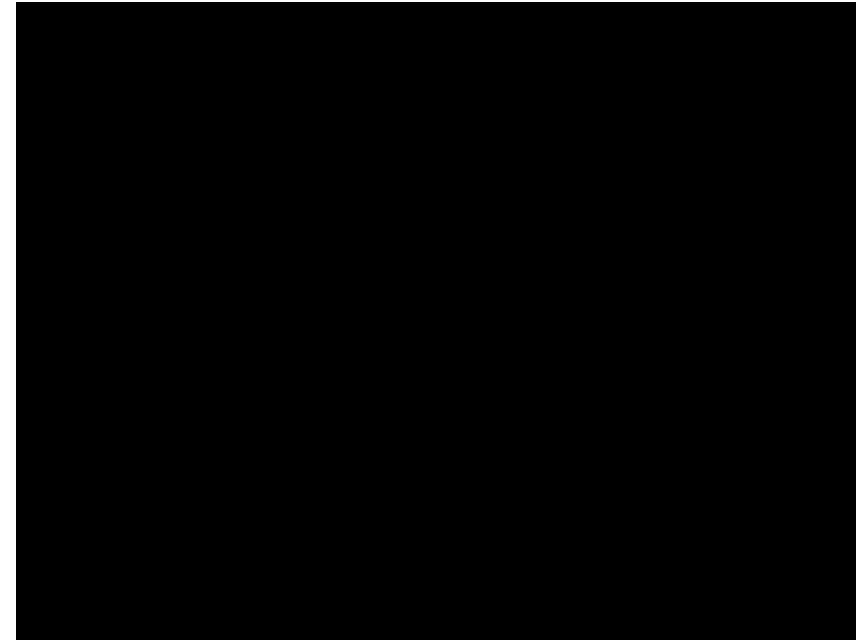
Mariana Machado¹, Pedro Marques-Vidal¹, Helena Cortez-Pinto^{1,2,*}

¹*Departamento de Gastreenterologia, Instituto de Medicina Molecular (IMM), Faculdade de Medicina da Universidade de Lisboa, Portugal*
²*Unidade de Nutrição e Metabolismo, Instituto de Medicina Molecular (IMM), Faculdade de Medicina da Universidade de Lisboa, Portugal*

Review

12 studies

1620 patients



Machado et al. **J Hepatol** 2006: 600-606

Hepatic histology in obese patients undergoing bariatric surgery

Mariana Machado¹, Pedro Marques-Vidal¹, Helena Cortez-Pinto^{1,2,*}

¹*Departamento de Gastrenterologia, Instituto de Medicina Molecular (IMM), Faculdade de Medicina da Universidade de Lisboa, Portugal*

²*Unidade de Nutrição e Metabolismo, Instituto de Medicina Molecular (IMM), Faculdade de Medicina da Universidade de Lisboa, Portugal*

Histological features	37%	91%	50%	60%	1.7%
Study	NASH (%)	Steatosis (%)	Inflammation (%)	Fibrosis (%)	Cirrhosis (%)
Marceau et al. [11]	—	86	24	74	2
Dixon et al. [12]	25	96	58	26	1
Sepulveda-Flores et al. [13]	91	—	97	97	—
Poniachik et al. [14]	—	91	46	47	1
Beymer et al. [15]	33	85	50	48	0
Spaulding et al. [16]	56	90	75	52	2
Abrams et al. [18]	36	98	98	67	2
Shalhub et al. [19]	37	—	—	13	7
Ong et al. [22]	24	93	—	25	1
Boza et al. [23]	26	—	—	24	2
Lima et al. [24]	57	99	60	21	0
Stratopoulos et al. [25]	98	98	—	94	0
Total	37	91	50	60	1.7

NASH was not related with age or body mass index

Association between **male sex** and NASH/hepatic fibrosis.

Diabetes mellitus and insulin resistance - NASH

Hypertension - advanced hepatic fibrosis

Machado et al. **J Hepatol** 2006: 600-606



Evolving aspects of liver transplantation for nonalcoholic steatohepatitis

Michael Charlton



Charlton **Curr Opin Organ Tx** 2013

Evolving aspects of liver transplantation for nonalcoholic steatohepatitis

Michael Charlton

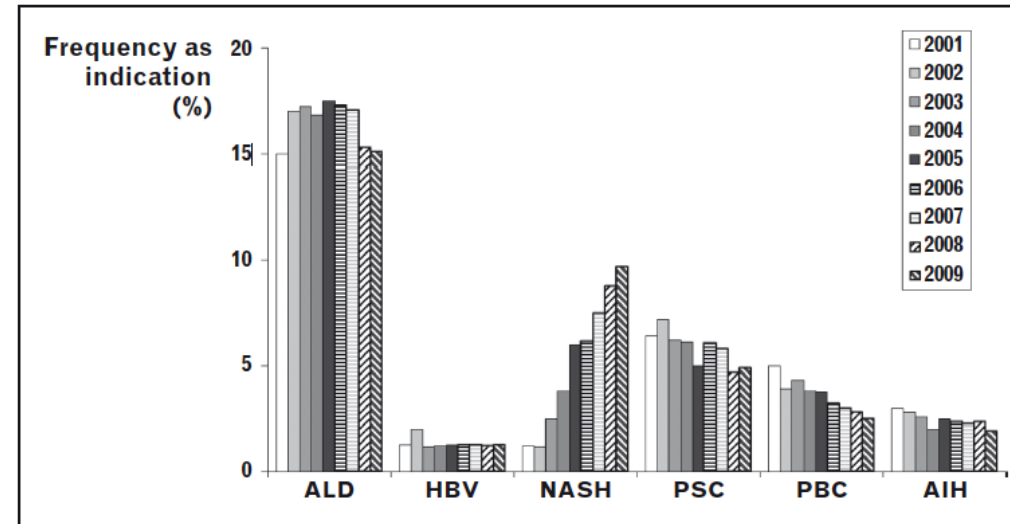
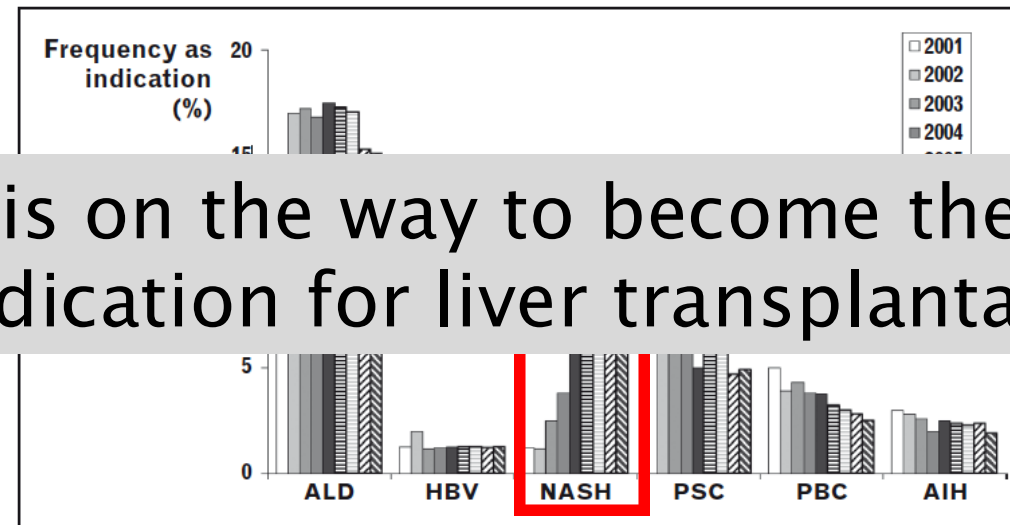


FIGURE 1. The frequencies of specific indications for liver transplantation among adults in the USA are shown. AIH, autoimmune hepatitis; ALD, alcoholic liver disease; CC, cryptogenic cirrhosis; HBV, hepatitis B virus; PBC, primary biliary cirrhosis; PSC, primary sclerosing cholangitis.

Charlton Curr Opin Organ Tx 2013

Evolving aspects of liver transplantation for nonalcoholic steatohepatitis

Michael Charlton



NASH is on the way to become the leading indication for liver transplantation

FIGURE 1. The frequencies of specific indications for liver transplantation among adults in the USA are shown. AIH, autoimmune hepatitis; ALD, alcoholic liver disease; CC, cryptogenic cirrhosis; HBV, hepatitis B virus; PBC, primary biliary cirrhosis; PSC, primary sclerosing cholangitis.

Charlton Curr Opin Organ Tx 2013



Challenges and Management of Liver Cirrhosis: Practical Issues in the Therapy of Patients with Cirrhosis due to NAFLD and NASH

Stefan Traussnigg Christian Kienbacher Emina Halilbasic Christian Reichling
Lili Kazemi-Shirazi Harald Hofer Petra Munda Michael Trauner

Division of Gastroenterology and Hepatology, Medical University of Vienna, Vienna, Austria

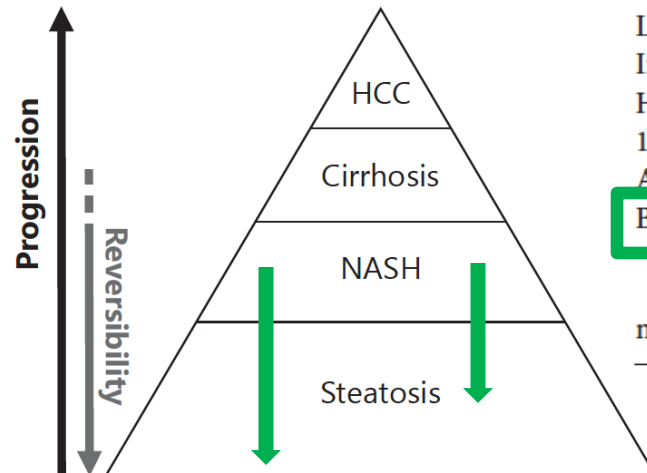


Table 1. Therapeutic approaches in NASH

Metabolically oriented (→ liver)	Liver(-gut) oriented (enterohepatic)
Lifestyle (diet, exercise)	Antioxidative (vitamin E)
Insulin sensitizers, GLP-1	Cytoprotective (UDCA)
Hypolipidemic agents, 3-PUFA	Anti-inflammatory (PFX)
11β-HSD blockers	Antifibrotic (LOXL-2 inhibitors)
Antihypertensive (AT-II)	Anti-/probiotics
Bariatric surgery	Bile acid receptor ligands (FXR agonists)

GLP-1 = Glucagon-like peptide 1; HSD = hydroxysteroid dehydrogenase; PUFA = polyunsaturated fatty acid.

Traussnigg et al. *Dig Dis Sci* 2015: 598-607

Bariatric Surgery → Metabolic Surgery



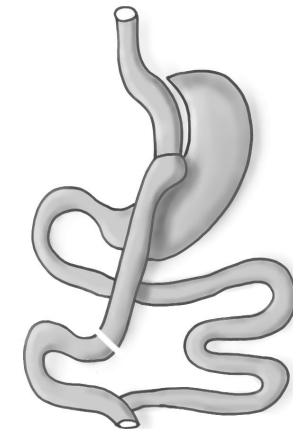


Review Article

Bariatric Surgery as Potential Treatment for Nonalcoholic Fatty Liver Disease: A Future Treatment by Choice or by Chance?

TABLE 1: Considerable studies showed that RYGB is associated with marked improvement in NAFLD.

Study	Ref	Main outcomes	Type of study	Sample size	Followup
Silverman et al., 1995	[20]	Improved steatosis and fibrosis	Retrospective cohort	91	18.4 months
Clark et al., 2005	[21]	Improved steatosis, fibrosis, and inflammation	Prospective cohort	16	305 ± 131 days
Mattar et al., 2005	[22]	Improved metabolic syndrome, steatosis, and fibrosis	Prospective cohort	70	15 ± 9 months
Mottin et al., 2005	[23]	82% improvement in liver steatosis and fibrosis not measured	Retrospective cohort	90	12 months
Klein et al., 2006	[24]	Decreased factors lead to liver fibrosis and inflammation	Prospective cohort	7	12 months
Barker et al., 2006	[25]	Improved histology of NAFLD	Prospective cohort	19	21.4 months
Csendes et al., 2006	[26]	Improved histology in 80%	Prospective cohort	16	22 months
de Almeida et al., 2006	[27]	Improved steatosis, fibrosis, and inflammation	Prospective cohort	16	23.5 ± 8.4 months
Furuya et al., 2007	[28]	Improved steatosis and fibrosis	Prospective cohort	18	24 months
Liu et al., 2007	[29]	Resolved NASH in 60%	Retrospective cohort	39	18 months
Weiner 2010	[30]	Complete regression of NAFLD in 83%	Retrospective cohort	116	18.6 ± 8.3 months
Moretto et al., 2012	[31]	Resolved fibrosis in 50%	Retrospective cohort	78	Unavailable



Roux-en-Y
gastric bypass

Hafeez et al. J Obes 2013





Bariatric Surgery Improves Histological Features of Nonalcoholic Fatty Liver Disease and Liver Fibrosis

Andrew A. Taitano • Michael Markow • Jon E. Finan •
Donald E. Wheeler • John Paul Gonzalvo •
Michel M. Murr

steatosis	resolved in 75%
lobular inflammation	resolved in 75 %
chronic portal inflammation	resolved in 49%
steatohepatitis	resolved in 90 %

Taitano et al. J Gastrointest Surg 2015; 429-437

Bariatric Surgery Diabetes Surgery NASH Surgery



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The Multicenter Belgian Survey on Liver Transplantation for Hepatocellular Failure after Bariatric Surgery

A. Geerts, T. Darius, T. Chapelle, G. Roeyen, S. Francque, L. Libbrecht, F. Nevens, J. Pirenne, and R. Troisi

**HUMAN
ORGAN
FOR TRANSPLANT**

Transplantation Proceedings, 42, 4395–4398 (2010)



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Table 1. Characteristics of Patient Population Developing Liver Failure after BPD

Patient	1	2	3	4	5	6	7	8	9
Gender	Female	Male	Female	Female	Female	Female	Female	Female	Female
Age (y)	52	38	29	19	46	53	35	38	40
Year of BPD	2000	2003	1998	2003	1997	2001	1999	1987	1994
Initial BMI	65	48	40	41	55	40	45	40	47
Post-BPD BMI	41	23	20	20	29	24	25	22	25
Maximum weight loss (kg)	88	88	60	47	55	40	45	53	50
Onset of LF after BPD (mo)	13	27	84	62	11	18	20	21	14
Time of OLT after BPD (mo)	22	85	listed	65	11	18	21	Died on list	Died on list
Waiting time on list (mo)	3	9	listed	3	2	2d	1	Died on list	Died on list
Time of BPD reversal	OLT	OLT	—	8 wk after OLT	OLT	OLT	OLT	—	—

Abbreviations: BPD, biliopancreatic diversion; BMI, body-mass index (kg/m^2); LF, liver failure; OLT, orthotopic liver transplantation.

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Too much of good thing...

...might be bad.

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Post-BPD BMI	41	23	20	20	29	24	25	22	25
Maximum weight loss (kg)	85	88	60	47	55	40	45	53	50
Onset of LF after BPD (mo)	2	27	84	2	1	15	2	21	14
Time of OLT after BPD (mo)	2	25	84	2	1	18	2	Died on list	Died on list
Waiting time on list (mo)	3	9	listed	—	2	2d	1	Died on list	Died on list
Time of BPD reversal	OLT	OLT	—	8 wk after OLT	OLT	OLT	OLT	—	—

CAVE: Length of BPL!

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Reinventing the bariatric wheel: what we know, thought we knew and hope to learn

„Although we have made considerable progress in improving the safety and efficacy of bariatric operations, we still have a lot to learn“.

Keep in mind: Enthusiasm about VBG and LAGB

Evaluation of a procedure: at least sound 5a Fup data!











