

Redo Surgery. Actual Trend

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Chair Scientific Committee International Federation for Surgery of Obesity and Metabolic Disorders (IFSO EC)

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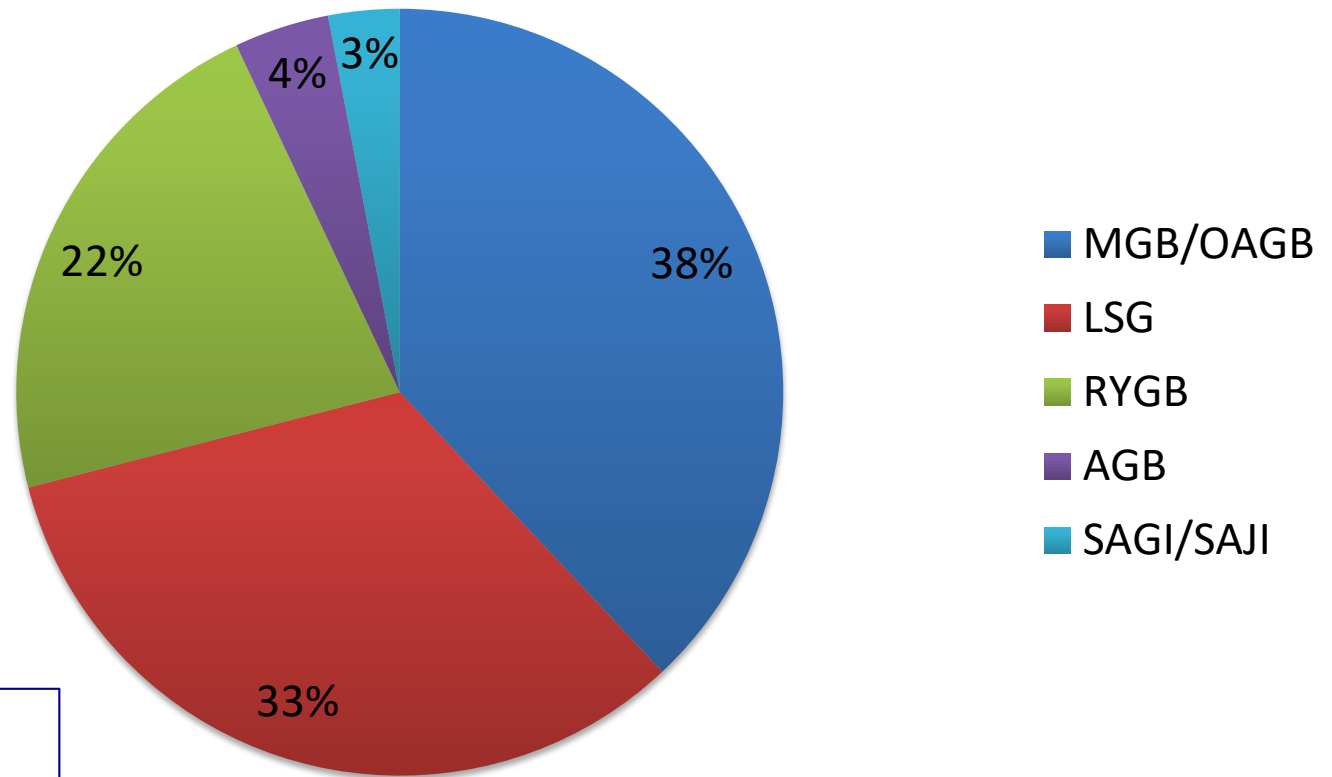
Scientific Committee Italian Society of Obesity (SIO)

Scientific Committee The Upper Gastrointestinal Surgeons (TUGS)

19 Maggio 2022

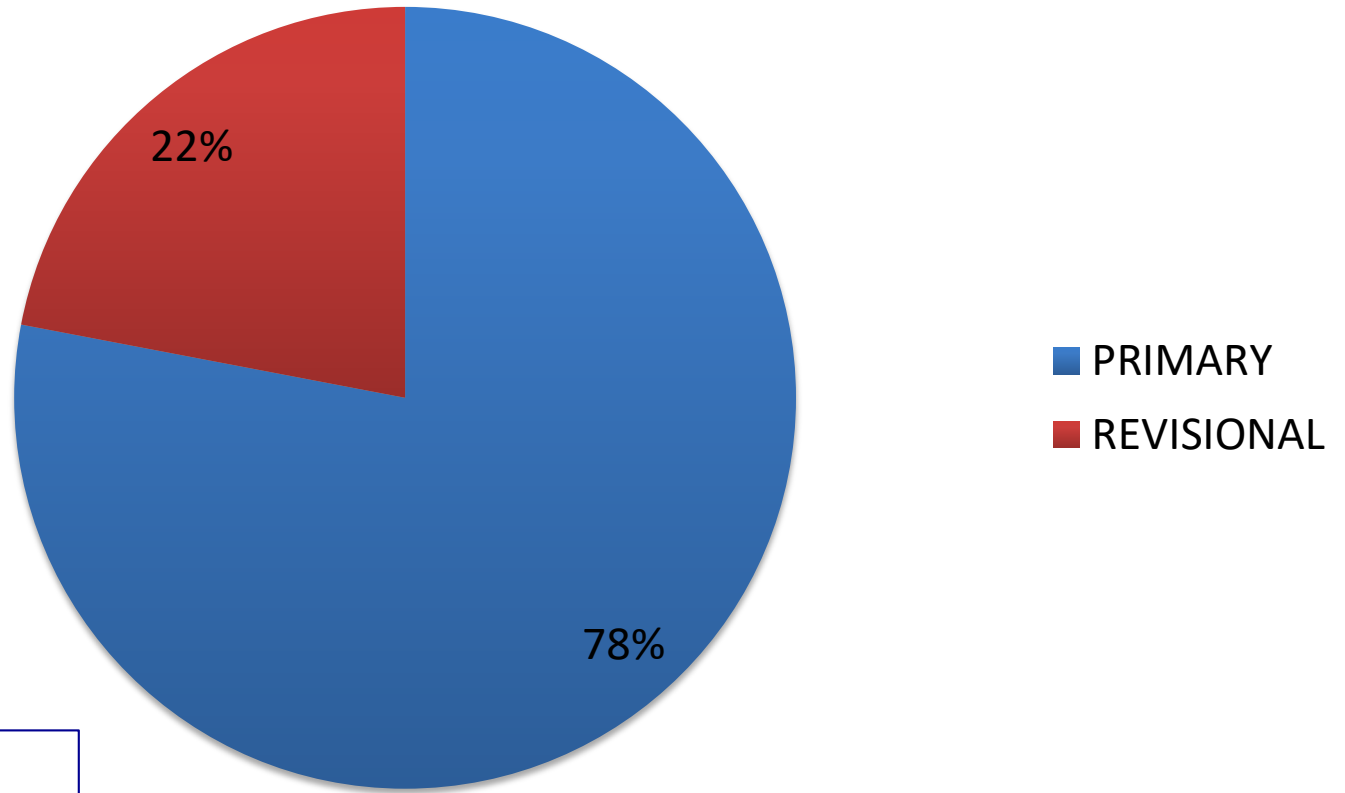


Case Mix Disclosure



Maurizio De Luca
Last 5 years activity

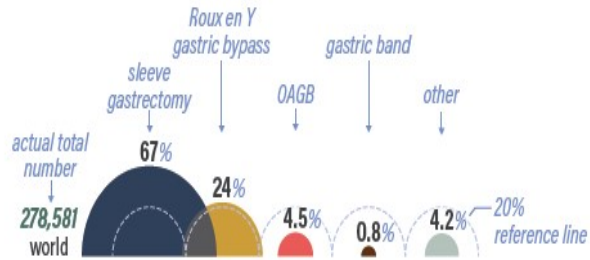
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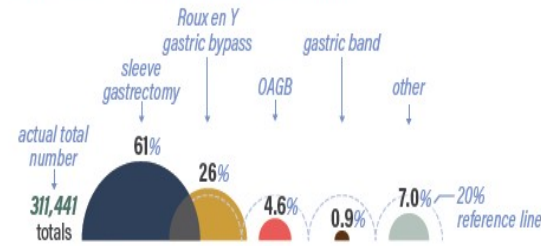
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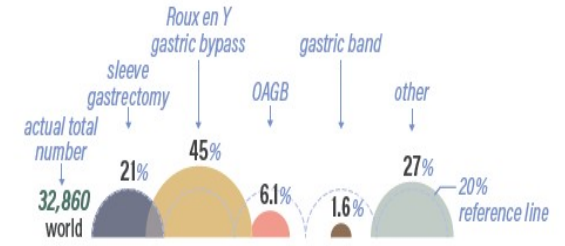
Primary procedures by type
World total of primary procedures



All procedures (primary and revisional) by type



Revisional procedures by type
World total of revisional procedures



7th IFSO Global Registry Report, 2022

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There are **no agreed definitions** as to what constitutes a **'failure'** of the primary bariatric procedure in relation to weight loss.

Where it is necessary to **select** patients for revisional procedures, it would be advantageous to have **standardised criteria** against which to judge their weight loss

Terminology

Suboptimal initial response to metabolic/bariatric surgery is demonstrated **either** by inadequate weight loss **OR** inadequate improvement of complication that was an indication for surgery
(to replace “insufficient weight loss”)

A **late post-operative clinical deterioration** is demonstrated **either** by recurrent weight gain **OR** by worsening of a significant complication after an initially post-operative clinical response.
(to replace “weight regain”)



ELSEVIER



Surgery for Obesity and Related Diseases 18 (2022) 957–963

2022

SURGERY FOR OBESITY
AND RELATED DISEASES

Review article

Current state of the definition and terminology related to weight recurrence after metabolic surgery: review by the POWER Task Force of the American Society for Metabolic and Bariatric Surgery

Saniea F. Majid, M.D.^{a,*}, Matthew J. Davis, M.D.^b, Saad Ajmal, M.B.B.S.^c,
David Podkameni, M.D.^d, Kunoor Jain-Spangler, M.D.^e, Alfredo D. Guerron, M.D.^e,
Neil King, M.D.^f, David C. Voellinger, M.D.^g, C. Joe Northup, M.D.^h,
Colleen Kennedy, M.D.ⁱ, Stephen B. Archer, M.D.^j

Terminology

- The term *weight recurrence* was introduced to replace *weight regain or recidivism*
- The term *non responder* was introduced to replace *inadequate weight loss after surgery*



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Definition

Saniea F. Majid et al. / Surgery for Obesity and Related Diseases 18 (2022) 957–963

Table 2
Summary of the published insufficient weight loss and associated definitions

Definitions published	Terms being defined with references
EWL <50% 18 mo postoperatively	TWL [11]
EWL <50% from preoperative weight <20% TWL over time	TWL [36]
	TWL [37]

EWL = excess weight loss; TWL = total weight loss; IWL = insufficient weight loss.

Saniea F. Majid et al. / Surgery for Obesity and Related Diseases 18 (2022) 957–963

Table 1
Summary of the published weight recurrence and associated definitions

Definitions published	Terms being defined with references
>10 kg from nadir weight	WR [13,34]
>25% EWL from nadir weight	WR [34]
>5 BMI points from nadir weight	WR [23]
WR to a BMI of 35 kg/m ²	WR [14]
Any WR after remission of type 2 diabetes	WR [14]
Any WR	WR [14]
WR 5 yr postoperatively from the nadir weight, expressed as change in BMI or %TWL, or change in excess BMI lost or % EWL	WR [14]
Two yr s/p RYGB, patients who regained >10% of their lowest postoperative weight	WR [16]
Two yr s/p SG, WR of 5 kg from nadir weight	WR [13]
IWL <50% after reaching EWL >50%	WR [11]
Lack of maintenance of TWL >20%	WR [26]
Percentage of weight regained over nadir weight in 30 days from nadir (nadir = 5%; moderate = 5–15%; severe ≥15%)	WR [22]
Progressive weight regain that occurs after achievement of an initial successful weight loss defined as EWL >50%	WR [11]
BMI >35 kg/m ²	WR [14,23]
BMI >30 + EWL <50%	WR [39]
BMI >35 + EWL <50%	WR [30]
Increase of >15% total weight from nadir	WR [31]
36-mo WR: (36-mo weight – nadir weight)/nadir weight × 100%	WR [20]
48-mo WR: (48-mo weight – nadir weight)/nadir weight × 100%	
Current weight – lowest weight in postoperative time as a percent – age relative to the lowest weight	WR [32]
Significant WR = %WR ≥15%	
WR was evaluated relative to the amount of weight loss relative to nadir	WR [17]
WR/weight loss and WR/nadir at each subsequent weight measurement relative to the elapsed time since nadir	WR [17]
Primary nonresponse (1NR): inability to achieve adequate weight loss after surgery	Primary nonresponder [33]
Secondary nonresponse (2NR): excessive WR after initial adequate weight loss after surgery	Secondary nonresponder [33]
Progressive weight regain that occurs after achievement of an initial successful weight loss defined as EWL >50%	WR [11]
WR calculated from the minimum recorded weight	WR [11,34,35]
Percent WR = (5-yr recorded weight – minimum recorded weight × 100)/(preoperative weight – minimum recorded weight)	
>10% of the lowest postoperative weight	WR [16]
>15% of maximal EWL	WR [34]
>20% of weight loss after achieving goal weight loss	WR [7]
Goal weight loss defined as 15% TWL after SG, 25% TWL after RYGB	
Adequate weight loss (AWL) = achieved goal weight loss without the WR	
Nonresponders never achieve goal weight loss	
2 yr s/p RYGB with successful weight loss defined as ≥50% EWL in 1–2 yr postoperatively	WR [15]
WR defined >15% of the 1-yr postoperative weight	
S/p RYGB, all patients must have achieved nadir weight in the following time periods: 1–2 yr, 2–3 yr, 3–4 yr, 4–5 yr, 5–6 yr, and >6 yr postoperatively. WR is evaluated relative to weight loss	WR [17]
>10 kg weight gain from lowest postoperative weight	WR [13]

SG = sleeve gastrectomy; RYGB = Roux-en-Y gastric bypass; EWL = excess weight loss; TWL = total weight loss; IWL = insufficient weight loss; WR = weight regain/recurrence; s/p = status post; NR = nonresponders; AWL = adequate weight loss.

Redo Surgery. Actual Trend

Surgical Endoscopy (2020) 34:2332–2358
<https://doi.org/10.1007/s00464-020-07555-y>



GUIDELINES

Clinical practice guidelines of the European Association for Endoscopic Surgery (EAES) on bariatric surgery: update 2020 endorsed by IFSO-EC, EASO and ESPCOP

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2020



Redo surgery performed for two main reasons:

- 1) To solve complications or adverse events related to the first operation
- 2) To improve the results in terms of *insufficient weight loss, inadequate control of comorbidities and weight regain*

The term *revisional* surgery should be reserved for this second group



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Failure vs no responders

- Obesity = **chronic condition** requiring lifelong treatment
- The concept of **therapeutic failure** fits poorly with the treatment of a chronic condition
- The term **non-responder patients** would better mean the concept of failure
- **Primary and secondary no responders**

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Primary non responders

- **Early inadequate weight loss**, to allow a multimodal approach (intensive lifestyle modifications, cognitive-behavioral therapy, drug therapy)
- Evaluation of revision surgery after 18-24 months (nadir)



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Primary non responders - Definition

- Weight loss less than 10% of preoperative weight
- Insufficient weight loss to move the patient out of the class of obesity that made her/him eligible for surgery
- Insufficient weight loss to allow adequate control of comorbidities, including T2DM.

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Secondary non responders - Definition

- **Weight regain** after initial treatment success
- It should be considered about **24 months** after surgery, a period after which the effects of the bariatric/metabolic procedure has "stabilized"
- Progressive weight gain greater than 20-25% of total weight lost
- Sufficient weight regain to return the patient to the class of obesity that made him eligible for surgery
- Weight regain associated with inadequate control of complications

Cognitive-behavioral, dietary, pharmacological, and surgical actions on primary and secondary no responders

Information

- Only about 10% of patients **are well informed** about the possibility of surgery failure
- Frequent underestimation of **eating disorders and/or psychological disorders**
- Frequent inadequate information about the role of surgery and the importance of **patients compliance** (follow up)



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Cognitive-behavioral, dietary, pharmacological, and surgical actions on primary and secondary no responders

- For each no responsive patient, first step is to exclude a **significant anatomical alteration** (e.g. wide gastric pouch or wide gastro-jejunal anastomosis after RYGB)
- If excluded, the patient should undergo to **nutritional and psychological-psychiatric new evaluation.**

Redo after metabolic-bariatric surgery - Definition

- **Conversion:** surgical procedure different from the previous one
- **Correction:** modification of the previous procedure
- **Restoration:** restoration of preoperative condition (may be anatomical or functional)

ASMBS Revision Task Force, 2014

Redo after metabolic-bariatric surgery - Definition

- **Conversion:** surgical procedure different from the previous one
- **Revisional surgery:** modification or revision of the previous procedure
(replace “correction”)
- **Reversal surgery:** reestablish normal anatomy
(replace “restoration”)

- Fallimento dopo Bendaggio Gastrico Regolabile
- Fallimento dopo Sleeve Gastrectomy
- Fallimento dopo Bypass Gastrico
- Fallimento dopo OAGB
- Fallimento dopo BPD-DS
- Le Bipartizioni

- Fallimento dopo Bendaggio Gastrico Regolabile
- Fallimento dopo Sleeve Gastrectomy
- Fallimento dopo Bypass Gastrico
- Fallimento dopo OAGB
- Fallimento dopo BPD-DS

FALLIMENTO DOPO BENDAGGIO GASTRICO

- intervento a basso tasso di complicanze precoci
 - trend negativo nel suo impiego: da 42,3% (2008) a 17,8% (2011) a 2,77% (2017)
 - risultati a lungo termine non sempre soddisfacenti
-
- Marin-Perez P et al. *Outcomes after laparoscopic conversion of failed adjustable gastric banding to sleeve gastrectomy or Roux-en-Y gastric bypass*. Br J Surg **2014**;101:254-60.

FALLIMENTO DOPO BENDAGGIO GASTRICO

- principale causa di insuccesso è **inadeguata selezione** del paziente (ideale: iperfagico prandiale con buona compliance)
- fallimento riportato fino al 40-50%
- revisione/conversione fino al 30%

- O' Brien PE et al. *Long-term outcomes after bariatric surgery: fifteen-year follow-up of adjustable gastric banding and a systematic review of the bariatric surgical literature*. Ann Surg 2013 Jan;257(1):87-94
- Colquitt JL et al. *Surgery for weight loss in adults*. Cochrane database syst rev **2014** Aug 8;(8):CD003641

FALLIMENTO DOPO BENDAGGIO GASTRICO

- proponibile conversione a sleeve gastrectomy, RYGB, MGB, DBP-DS, SADI-S
 - preferibile la conversione a **SG, RYGB o OAGB/MGB**
 - interventi in uno o due tempi (programma individualizzato)
-
- Moon R et al. *Conversion of failed laparoscopic adjustable gastric banding: sleeve gastrectomy or Roux- en-Y gastric bypass?* Surg Obes Relat Dis 2013;9:901-7.
 - Dang JT et al. *Gastric band removal in revisional bariatric surgery, one- step versus two-step: a systematic review and meta-analysis.* Obes Surg 2016;26:866-73.

FALLIMENTO DOPO BENDAGGIO GASTRICO

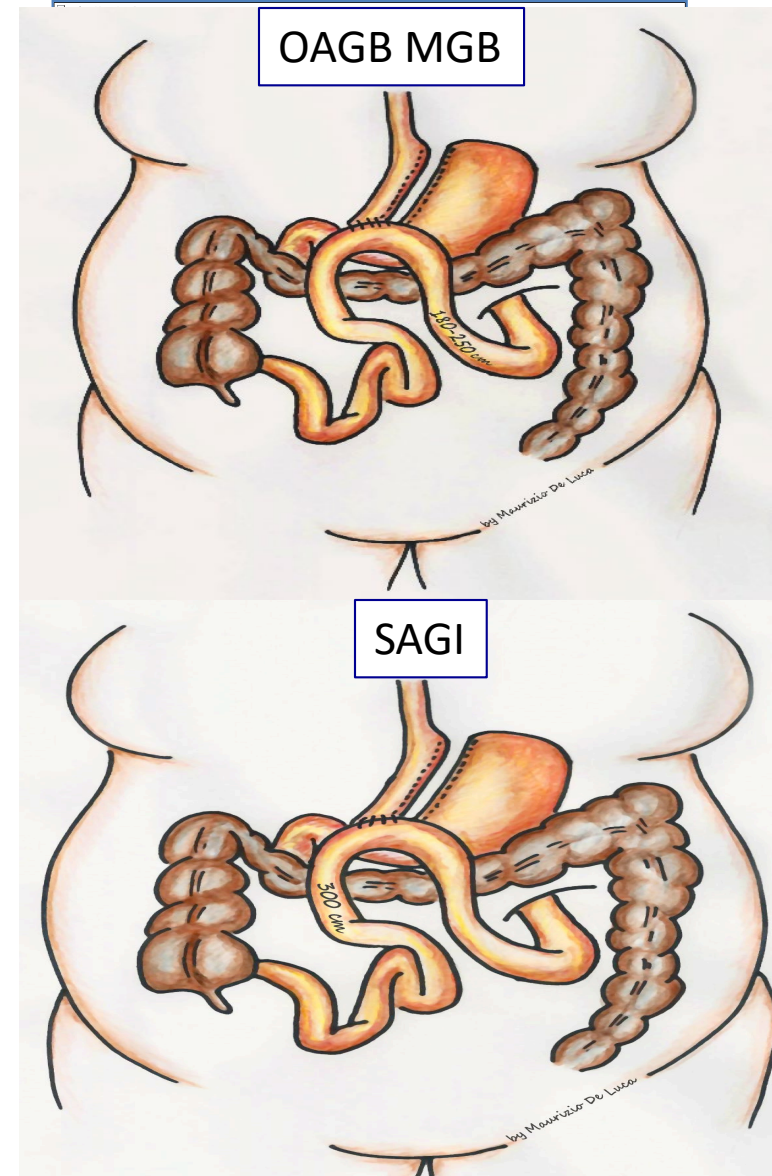
Single Anastomosis Gastric-Ileal (SAGI)

- Collis operation
- gastro-ileal anastomosis
- pure malabsorptive procedure

INDICATIONS

- 1) Insufficient weight loss or weight regain after **Gastric Banding** and **Sleeve Gastrectomy**, especially when the reason of failure is related to patient lack of compliance, and not related to gastric pouch dilatation
- 2) Insufficient weight loss or weight regain after **OAGB/MGB**
- 3) primary surgery for OAGB/MGB candidate patients **with short small bowel**

A New Concept In Surgery For Obesity And Weight Related Disease. Single Anastomosis Gastro-ileal (Sagi): Technical Details And Preliminary Results
Maurizio De Luca, Jacques Himpens, Luigi Angrisani, Nicola Di Lorenzo, Kamal Mahawar, Cesare Lunardi, Natale Pellicanò, Nicola Clemente And Scott Shikora.
Obesity Surgery, 2017, 27, 1, 143-147



- Fallimento dopo Bendaggio Gastrico Regolabile
- **Fallimento dopo Sleeve Gastrectomy**
- Fallimento dopo Bypass Gastrico
- Fallimento dopo mini bypass gastrico
- Fallimento dopo BPD-DS

FALLIMENTO DOPO SLEEVE GASTRECTOMY

- attualmente la procedura di chirurgia bariatrica **più eseguita** al mondo
- incremento conseguente dell'incidenza di fallimento, attualmente fino al 30% a 5 anni
- probabilmente incidenza maggiore, dato da elevato drop-out e follow-up a solo 5 anni

7th IFSO Global Registry Report, 2022

FALLIMENTO DOPO SLEEVE GASTRECTOMY

- Prevalente insuccesso è il recupero ponderale
- Possibili **cause**:
 1. dilatazione dello stomaco residuo
 2. uso di sonda calibrante eccessiva
 3. sezione incompleta del fondo gastrico
- Weiner RA, Weiner S, Pomhoff I et al (2007) *Laparoscopic sleeve gastrectomy: influence of sleeve size and 120 resected gastric volume*. *Obes Surg* 17:1297–1305

FALLIMENTO DOPO SLEEVE GASTRECTOMY

- considerare sempre fattori **psicologici/psichiatrici** (spesso pazienti scarsamente studiati pre-operatoriamente)
- **GERD**: va considerato come fallimento nella misura in cui diventa invalidante per la qualità di vita (QoL) del paziente
- J. Homan et al. *Secondary surgery after sleeve gastrectomy: Roux-en-Y gastric bypass or biliopancreatic diversion with duodenal switch*. SOARD **2014**.

FALLIMENTO DOPO SLEEVE GASTRECTOMY

- se dilatazione del tubulo: re-sleeve, RYGB, MGB, DBP-DS, SADI-S, SAGI
 - se fondo gastrico residuo: fundectomia
 - se GERD invalidante: RYGB (OAGB? SADI-S?)
 - se mancato controllo T2DM: RYGB, OAGB/MGB, DBP-DS, SADI-S, SAGI
-
- P. Noel, M. Nedelcu et al. *Revised sleeve gastrectomy: another option for weight loss failure after sleeve gastrectomy.* Surg Endosc (2014) 28:1096–1102.
 - Moon RC et al. *Conversions After Sleeve Gastrectomy for Weight Regain: to Single and Double Anastomosis Duodenal Switch and Gastric Bypass at a Single Institution.* Obes Surg. 2018 Sep 24.

Original article

Single-anastomosis duodenoileal bypass as a second step after sleeve gastrectomy

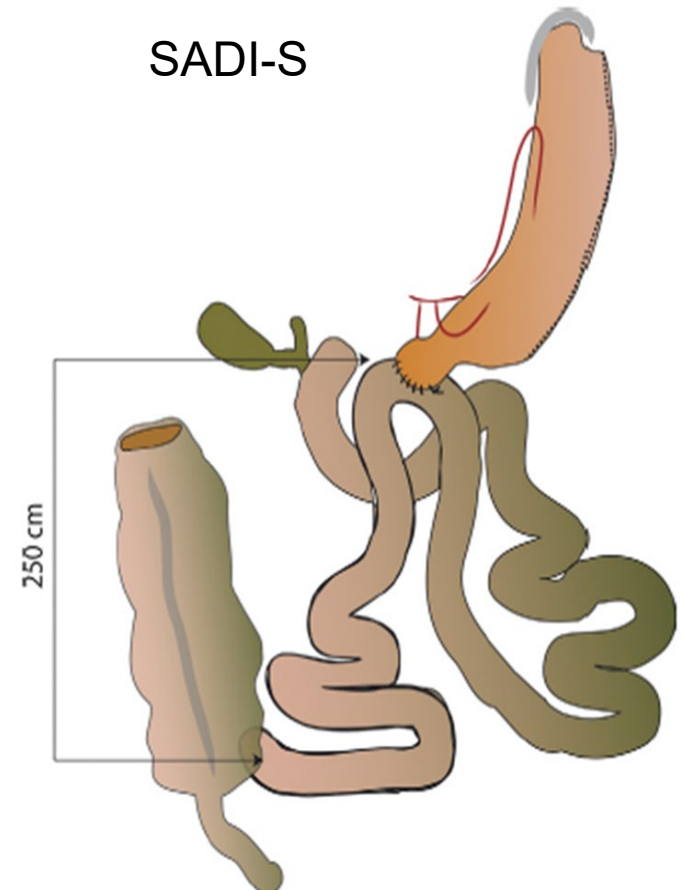
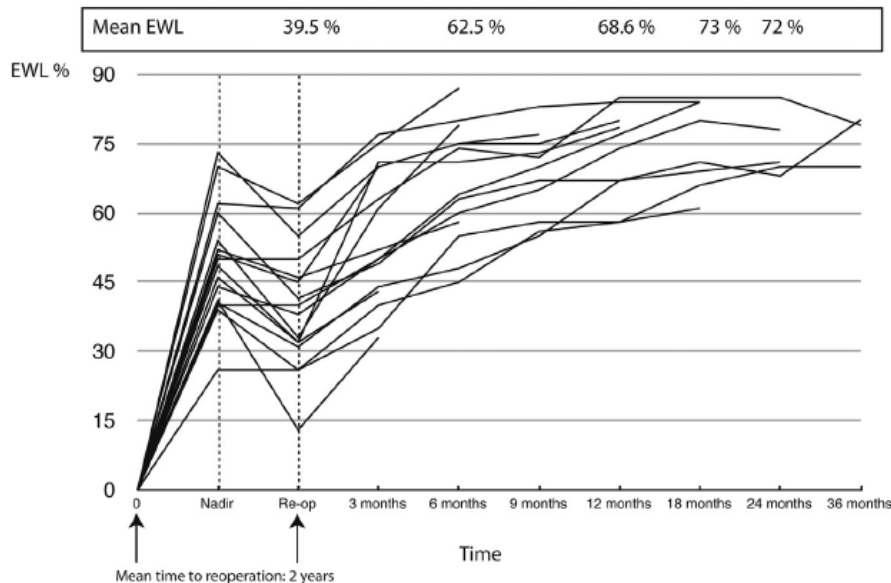
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Elia Pérez-Aguirre^a, Antonio Torres^a

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Obesity, Bariatric and
Metabolic Surgery
SADI-S Chapter
2019 (pp 463-467

➤ %EWL 12 MONTHS: 68,6%

➤ %EWL 24 MONTHS: 72%



Original article

Single-anastomosis duodenoileal bypass as a second step after sleeve gastrectomy

Andrés Sánchez-Pernaute^{a,*}, Miguel Ángel Rubio^b, María Conde^a, Emmy Arrue^a,
Elia Pérez-Aguirre^a, Antonio Torres^a

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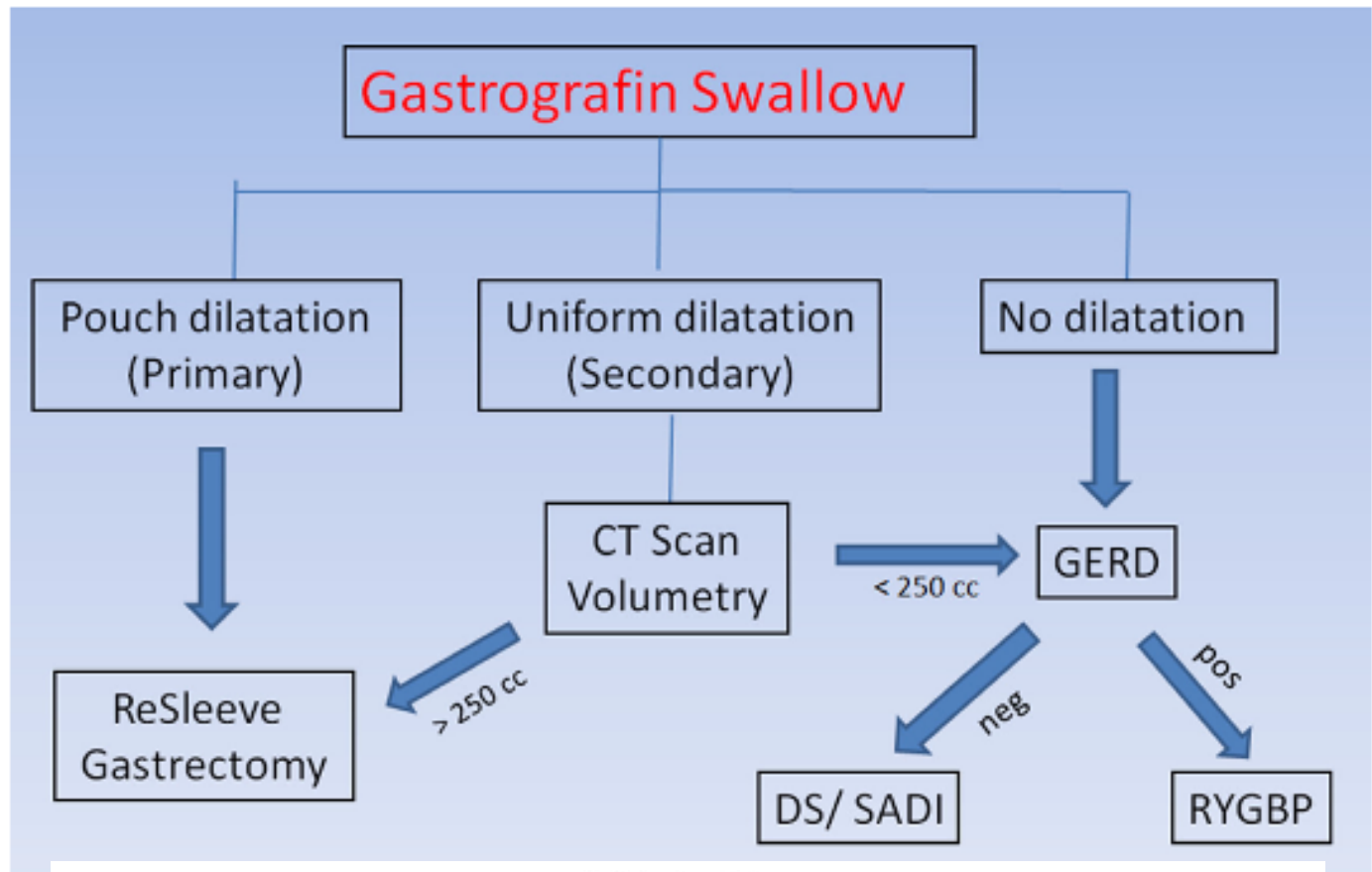
Obesity, Bariatric and
Metabolic Surgery
SADI-S Chapter
pp 463-467

LOW RATE OF POSTOPERATIVE NUTRITIONAL DEFICIENCIES

Nutritional values after sleeve and after single-anastomosis duodenoileal bypass

	Postsleeve			Post-SADI		
	Mean (SD)	Range	% Abnormal	Mean (SD)	Range	% Abnormal
Iron (µg/mL)	78.7 (33.0)	42–156	0	66.5 (26.1)	30–104	50
Vitamin B12 (pg/mL)	357 (126)	158–554	6	414.5 (295.6)	172–1294	6
Folic acid (ng/mL)	6.5 (5.06)	2.03–20.3	12	6.0 (2.9)	2.0–11.3	6
Vitamin D (ng/mL)	23.1 (15.1)	9.7–59.8	Deficiency 6 Insufficiency 50	17.2 (12.7)	3.9–53.7	Deficiency 6 Insufficiency 50
Parathormone (pg/mL)	69.4 (31.8)	16.6–113	25	72.4 (38.1)	28.9–155	25
Albumin (g/dL)	4.1 (0.2)	3.6–4.5	0	4 (.2)	3.7–4.3	0
Proteins (g/dL)	7.1 (0.4)	6.3–7.7	6	6.7 (.3)	6.2–7.4	18
Copper (µg/mL)	125.8 (13.2)	109–146	0	95.4 (20.6)	59–124	12
Selenium (µg/mL)	79.3 (7.9)	109–146	0	60.6 (18.1)	35–96	50
Zinc (µg/mL)	84 (9.5)	65–95	0	67.9 (11.9)	54–88	31
Vitamin A (mg/L)	.4 (0.1)	.3–.5	0	.3 (.1)	.2–.6	25
Vitamin E (mg/L)	12.9 (2.3)	10.7–16	0	9.6 (2.5)	6.2–15	0

FALLIMENTO DOPO SLEEVE GASTRECTOMY



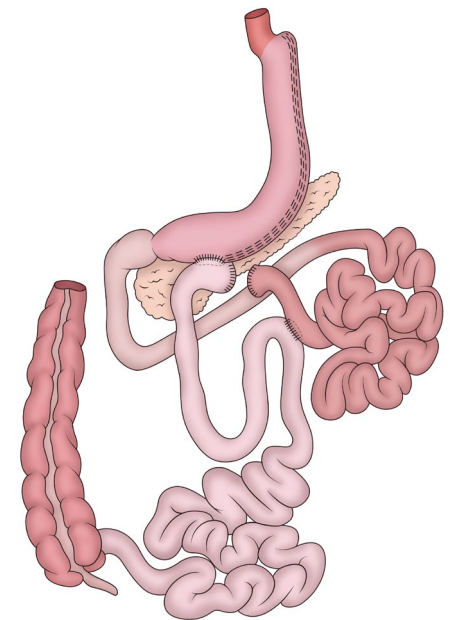
Original article

Revised sleeve gastrectomy (re-sleeve)

Marius Nedelcu, M.D.^{a,b,*}, Patrick Noel, M.D.^a, Antonio Iannelli^c, Michel Gagner, M.D.^d
F.R.C.S.C., F.A.C.S., F.A.S.M.B.S.^d

Sleeve Gastrectomy – Transit Bipartition (SG-TB) Rationale

- ◆ Modulation of the neuroendocrine control of hunger and satiety
- ◆ Inflicting no harm to important digestive function such as gastrointestinal motility, peristalsis and enzyme secretion
- ◆ Avoiding excluded segments of the small bowel
- ◆ Based on these concepts, in 2003 Santoro introduced a sleeve gastrectomy procedure with transit bipartition (SG + TB)



Santoro S, Velhote MCP, Malzoni CE, et al. Digestive adaptation: a new surgical proposal to treat obesity based in physiology and evolution. Einstein. 2003;1(2):99–104.

Transit Bipartition

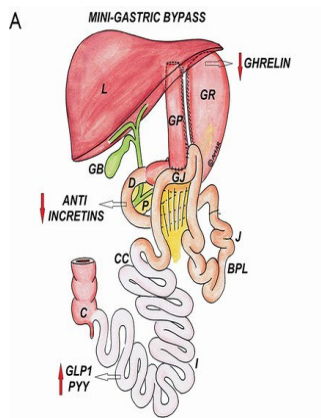


**It Keeps the stomach
in the right position
Avoiding twisting of the
Sleeve Gastrectomies**

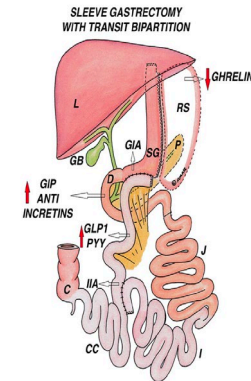
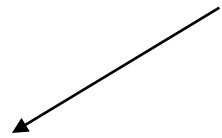
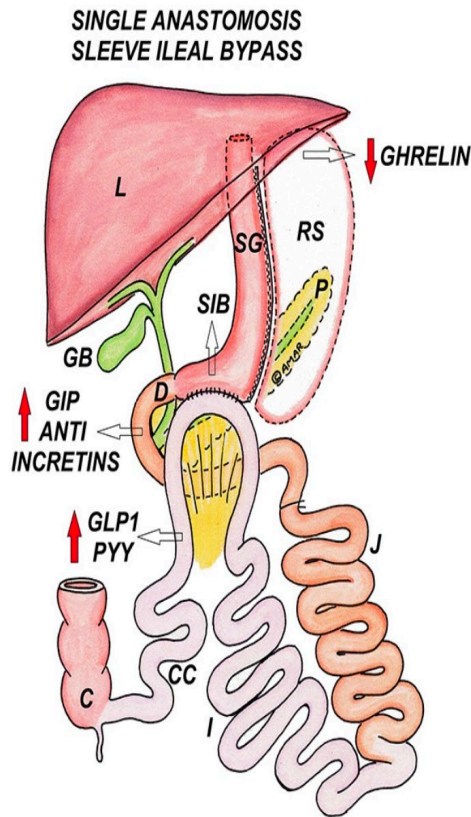
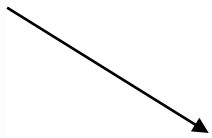


Single Anastomosis Sleeve Ileal – SASI Rationale

One anastomosis concept No duodenal exclusion and ileum early stimulation



MGB



Bowel bipartition

Complicanze ed insuccessi: chirurgia bariatrica e di revisione

- Introduzione
- Fallimento dopo Bendaggio Gastrico Regolabile
- Fallimento dopo Sleeve Gastrectomy
- Fallimento dopo Bypass Gastrico
- Fallimento dopo OAGB
- Fallimento dopo BPD-DS



Surgery for Obesity and Related Diseases 7 (2011) 516–525

SURGERY FOR OBESITY
AND RELATED DISEASES



Original article 2011

Laparoscopic Roux-en-Y gastric bypass: 10-year follow-up

Kelvin Higa, M.D., F.A.C.S.^{a,b,c}, Tienchin Ho, M.D., F.A.C.S.^a, Francisco Tercero, M.D.^{a,b},
Tahir Yunus, M.D.^{a,b}, Keith B. Boone, M.D., F.A.C.S.^{a,b,c}

^aAdvanced Laparoscopic Surgery Associates, Fresno, California

^bUniversity of California, San Francisco-Fresno, Fresno, California

^cFresno Heart and Surgical Hospital, Fresno, California

Received November 9, 2009; accepted October 25, 2010

Long terms outcomes (> 10 years) after RYGB on 242 patients

- 33.2% (1 out of 3) failed to achieve a weight loss > 50%
- 16% experienced internal hernia
- 4.9% experienced gastrojejunal stenosis

Comparison of the Performance of Common Measures of Weight Regain After Bariatric Surgery for Association With Clinical Outcomes

Wendy C. King, PhD; Amanda S. Hinerman, MPH; Steven H. Belle, PhD; Abdus S. Wahed, PhD; Anita P. Courcoulas, MD, MPH 2018

eTable 5. Sensitivity analysis: weight regain by time since weight nadir among adults who underwent Roux-en-Y gastric bypass with imputed data^a

	Years since weight nadir									
	1 Year		2 Years		3 Years		4 Years		5 Years	
Timing, median (25th -75th %-ile)										
Years since initial surgery	3.0	(2.1-4.1)	3.9	(3.0-4.4)	4.8	(4.0-5.2)	5.4	(5.0-6.0)	6.1	(5.8-7.0)
Weight regain, median (25th -75th %-ile)										
Weight, kg	5.0	(2.3-8.6)	8.9	(5.0-14.0)	11.4	(6.4-17.4)	12.4	(7.5-19.6)	13.1	(7.8-20.2)
BMI, kg/m ²	1.8	(0.9-3.1)	3.2	(1.8-4.9)	4.1	(2.3-6.2)	4.4	(2.7-7.0)	4.6	(2.8-7.1)
% of pre-surgery weight	3.9	(1.8-6.6)	6.8	(3.9-10.2)	8.4	(5.0-12.9)	9.4	(5.9-14.5)	10.0	(6.2-14.7)
% of nadir weight	6.2	(2.9-10.5)	10.7	(6.4-16.9)	13.7	(7.8-20.8)	15.1	(9.1-23.3)	15.3	(9.5-23.7)
% of max weight lost	10.3	(5.0-18.1)	18.6	(10.5-28.7)	24.0	(13.9-35.9)	26.1	(16.8-40.5)	27.9	(17.1-42.8)
Clinically important weight regain^b, No. (%)										
≥10 kg	297	(19.1)	610	(42.5)	747	(55.2)	743	(60.5)	601	(63.5)
≥ 5 BMI points	135	(8.7)	342	(23.9)	506	(37.4)	521	(42.4)	432	(45.6)
≥10% of pre-surgery weight	152	(9.8)	382	(26.7)	552	(40.8)	575	(46.8)	478	(50.5)
≥10% of nadir weight	426	(27.5)	773	(53.9)	897	(66.3)	878	(71.5)	697	(73.6)
≥15% of nadir weight	195	(12.6)	458	(31.9)	592	(43.8)	619	(50.4)	495	(52.3)
≥10% of max weight lost	791	(51.0)	1102	(76.9)	1141	(84.3)	1079	(87.8)	826	(87.3)
≥20% of max weight lost	326	(21.0)	658	(45.9)	804	(59.4)	806	(65.7)	652	(68.9)
≥25% of max weight lost	207	(13.4)	469	(32.7)	639	(47.2)	640	(52.1)	541	(57.1)

Abbreviations: BMI, body mass index; max, maximum.

^aSee eAppendix 2 for a description of the imputation process. Of 1703 participants, a minimum of 137 and maximum of 158 participants who reached weight nadir during the final year of data collection in the 20 imputed datasets were excluded.

The Longitudinal Assessment of Bariatric Surgery-2 (LABS-2) was a prospective cohort study of 2458 pts



1406 pts underwent 3–7 years after RYGB



At 5 years:
43.6% regained > 5 BMI points
50.2% gained > than 15% of nadir weight



Weight Regain and Insufficient Weight Loss After Bariatric Surgery: Definitions, Prevalence, Mechanisms, Predictors, Prevention and Management Strategies, and Knowledge Gaps—a Scoping Review

Walid El Ansari^{1,2,3}  · Wahiba Elhag⁴

Received: 19 September 2020 / Revised: 1 December 2020 / Accepted: 7 December 2020 / Published online: 8 February 2021
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Table 1 Selected examples of definitions and prevalence of WR and IWL after BS

Characteristic	Unit/component/s	Examples
Definition		
WR	Using EWL %	> 25% EWL from nadir [17–19]
	Using nadir weight %	≥ 10% [8, 20] or > 15% of nadir weight [8, 9, 21, 22]
	Using nadir weight kg	≥ 10 kg from nadir [8, 21–23]
	Using maximum WL	≥ 10% [8, 24], ≥ 20 [8, 25] or ≥ 25 [8, 26] of maximum WL
	Using pre-surgery weight	≥ 10% WR of pre-surgery weight [8, 27]
	Using any WR after remission	Any WR after T2DM remission [28]
	Using any WR	Any WR [29]
	Using BMI	≥ 5 BMI kg/m ² points from nadir [30] Increase in BMI > 35 kg/m ² after successful WL [31]
IWL	Using EWL %	EWL of < 50% at 18 months [16]
Prevalence^a		
WR		Post-LAGB (38%) [32]; post-LSG (27.8%) [33]; post-RYGB (3.9%) [34]
IWL		After LSG (32–40%) [17, 35]; after RYGB, OAGB, and LSG combined (20%) [36]

1406 RYGB patients
5 years follow up

Range of definitions and prevalence selected are examples for illustration purposes only and do not include all examples in the literature. *EWL* excess weight loss, *WR* weight regain, *IWL* insufficient weight loss, *WL* weight loss, *T2DM* type 2 diabetes, *BMI* body mass index, *LAGB* laparoscopic adjustable gastric banding, *LSG* laparoscopic sleeve gastrectomy, *OAGB* one anastomosis gastric bypass

^a Prevalence of WR are different depending on choice of BS procedure, varied assessment methods (EWL, weight from Nadir), and various follow-up periods



Weight Regain and Insufficient Weight Loss After Bariatric Surgery: Definitions, Prevalence, Mechanisms, Predictors, Prevention and Management Strategies, and Knowledge Gaps—a Scoping Review

Walid El Ansari^{1,2,3}  • Wahiba Elhag⁴

Received: 19 September 2020 / Revised: 1 December 2020 / Accepted: 7 December 2020 / Published online: 8 February 2021
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1406 RYGB patients
5 years follow up

Predictors

Older age, male gender, higher preoperative BMI, mental health issues, presence of comorbidities (T2DM, hypertension, OSA)

Prevention and management

- Behavioral: cognitive behavioral therapy, remote acceptance-based behavioral intervention, lifestyle counseling
- Dietary: Counseling with dietitian, structured dietary intervention
- Pharmacological FDA approved: phentermine, phentermine–topiramate extended release, liraglutide, bupropion/naltrexone
off label: metformin, topiramate, zonisamide, bupropion

Sages Guidelines for revisional bariatric surgery

Prior to elective procedures, *anatomy should be defined* by review of available records, plus radiographic and/or endoscopic assessment
(level II, grade B)

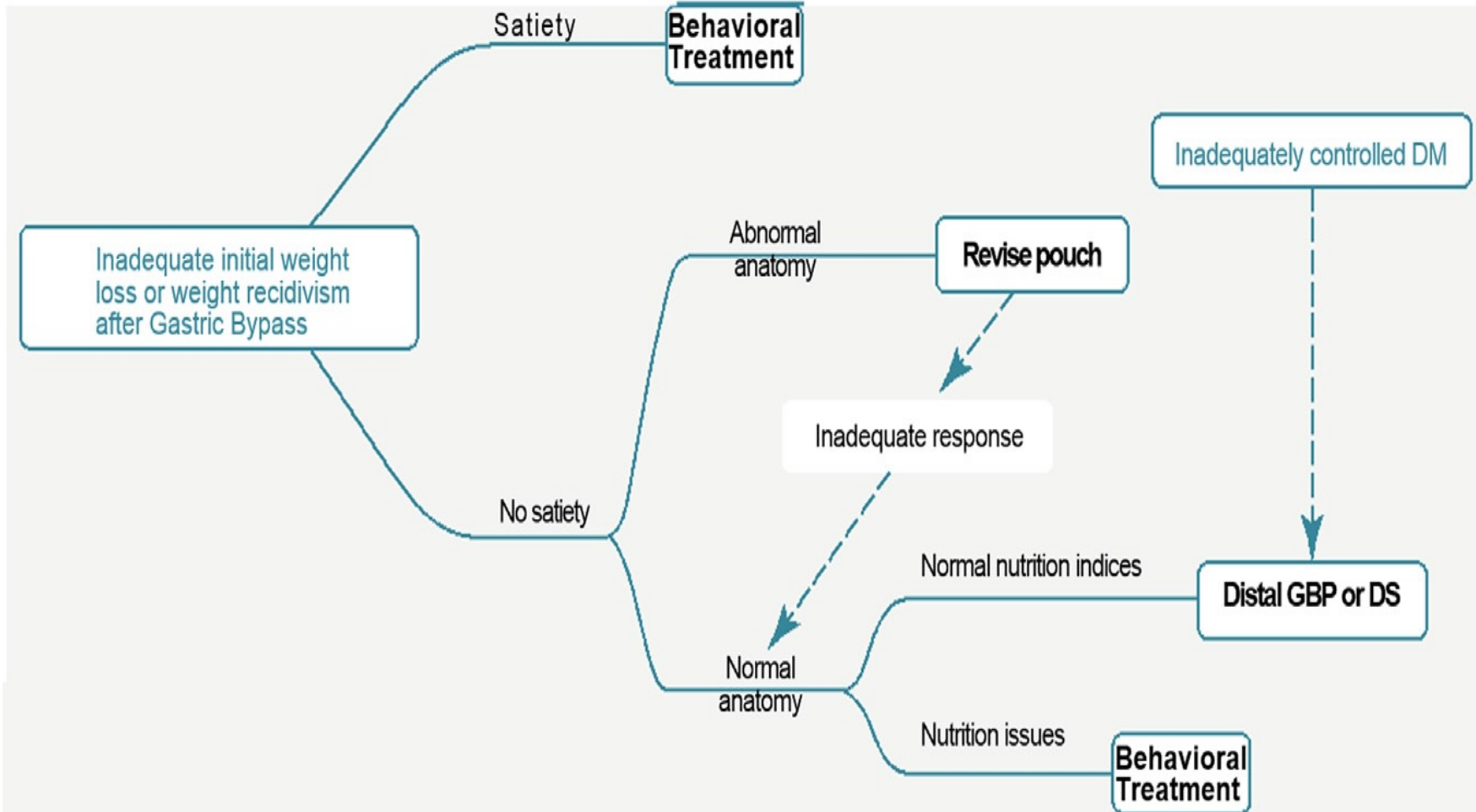
Laparoscopic revisional procedures may be performed safely, *but with more complications* than primary bariatric procedures, therefore the relative risks and benefits of laparoscopy should be considered on a case by-case basis
(level III, grade C)

- 1) History and Physical
 - BMI
 - Symptoms of dysmotility
 - Symptoms of acid hypersecretion
- 2) Screening for eating disorders
- 3) Psychological evaluation
- 4) Review previous operative notes
- 5) Barium swallow and/or CT scan with 3D reconstruction
- 6) EGD with stoma assessment

- ✓ Proper education, diet counseling and long-term follow up by multidisciplinary team are crucial.
- ✓ Preoperatively patients have to be evaluated for realistic goals, readiness for change and knowledge about nutrition

Redo Surgery. Actual Trend

Surgical Options After RYGB



SAGES Guidelines Committee / Surgery for Obesity and Related Diseases 5 (2009) 387– 405

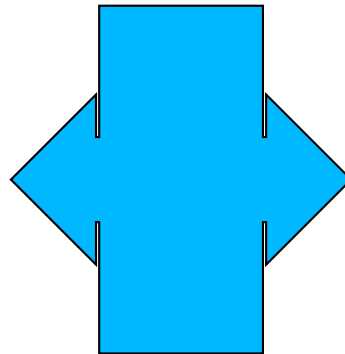
Redo Surgery. Actual Trend

Surgical Options After RYGB



Options 15 years ago

Placement of AGB /
Ring



Conversion to
DS

Revisional Bariatric Surgery for Inadequate Weight Loss

Andrew A. Gumbs, MD; Alfons Pomp, MD; Michel Gagner, MD

New York-Presbyterian Hospital, Division of Laparoscopy and Department of Surgery, Weill Cornell College of Medicine, New York, NY, USA

2007 Obesity Surgery, 17, 1137-1145

Redo Surgery. Actual Trend

Surgical Options After RYGB



2023 options

- Banded Gastric Bypass
- Reduction of Pouch
- Reduction of Stoma
- Distalization of RYGB
- Conversion to BPD/DS
- Conversion from RYGB to SAJ

Redo Surgery. Actual Trend

Surgical Options After RYGB



Reports have shown increased weight loss in more patients and less weight regain with the prevention of the formation of large gastric reservoir.

Surgery for Obesity and Related Diseases 2012 8, 408-415 DOI: (10.1016/j.soard.2011.09.010)

“Since Roux-en-Y Gastric Bypass is primarily a restriction operation, just as with VBG, it is important that the outlet of the pouch does not stretch.”

E.Mason

Obesity Surgery 1994;4:66-72

Redo Surgery. Actual Trend

Surgical Options After RYGB

Laplace's and Poiseuille's Law

$$P=2T/r$$

P = pressure

T = surface tension

R = radius

- *Long narrow pouches should have less tendency to enlarge and should delay the transit of material to a greater degree than wider pouches, according to the Laplace's and Poiseuille's Laws.*
- Data strongly suggest *that long narrow pouches* with a restrictive outlet are the most effective operations in bariatric



Original article

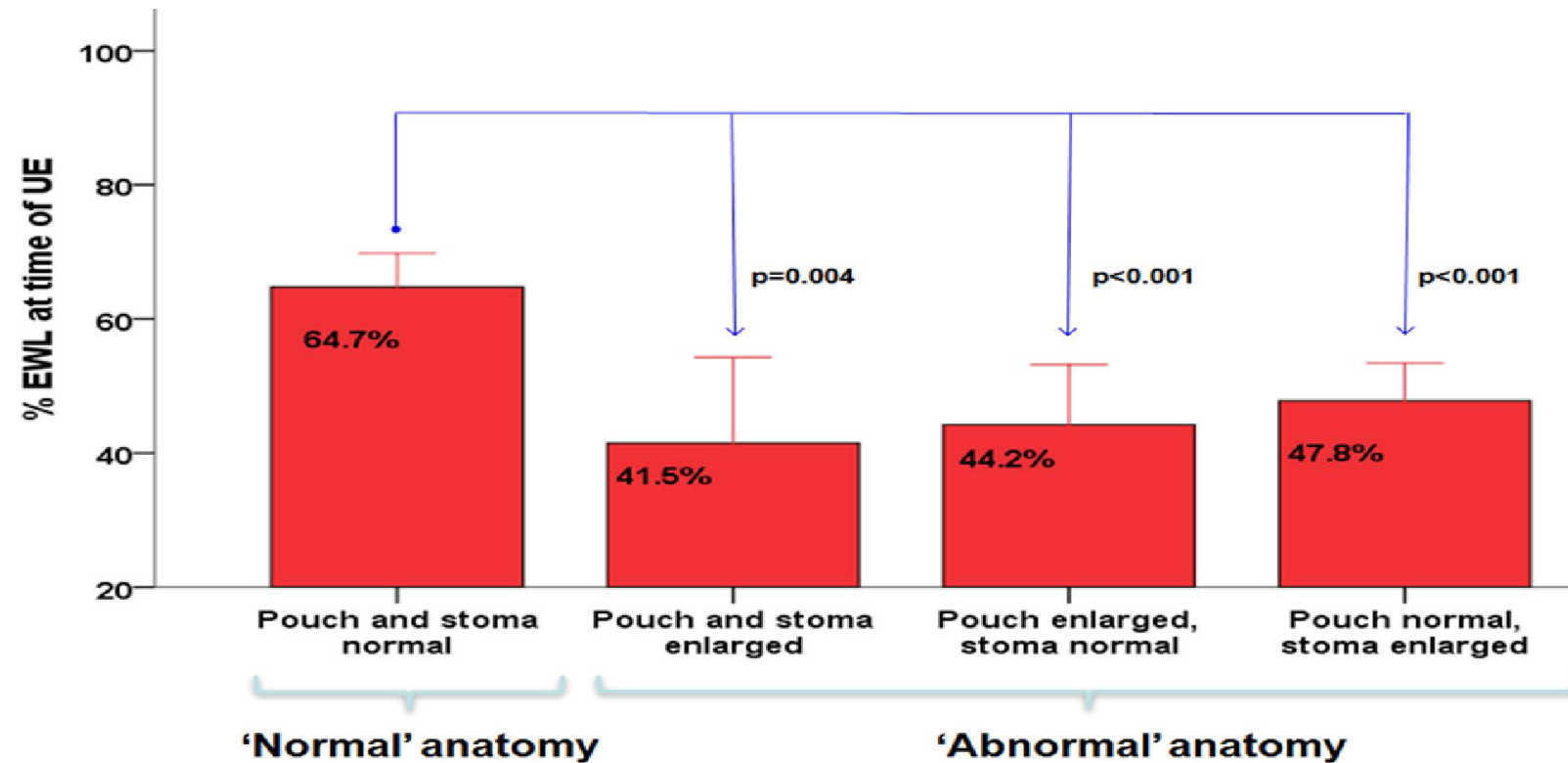
Influence of pouch and stoma size on weight loss after gastric bypass

Helen M. Heneghan, M.D., Panot Yimcharoen, M.D., Stacy A. Brethauer, M.D.,
Matthew Kroh, M.D., Bipan Chand, M.D.*

Bariatric and Metabolic Institute, Cleveland Clinic Foundation, Cleveland, Ohio

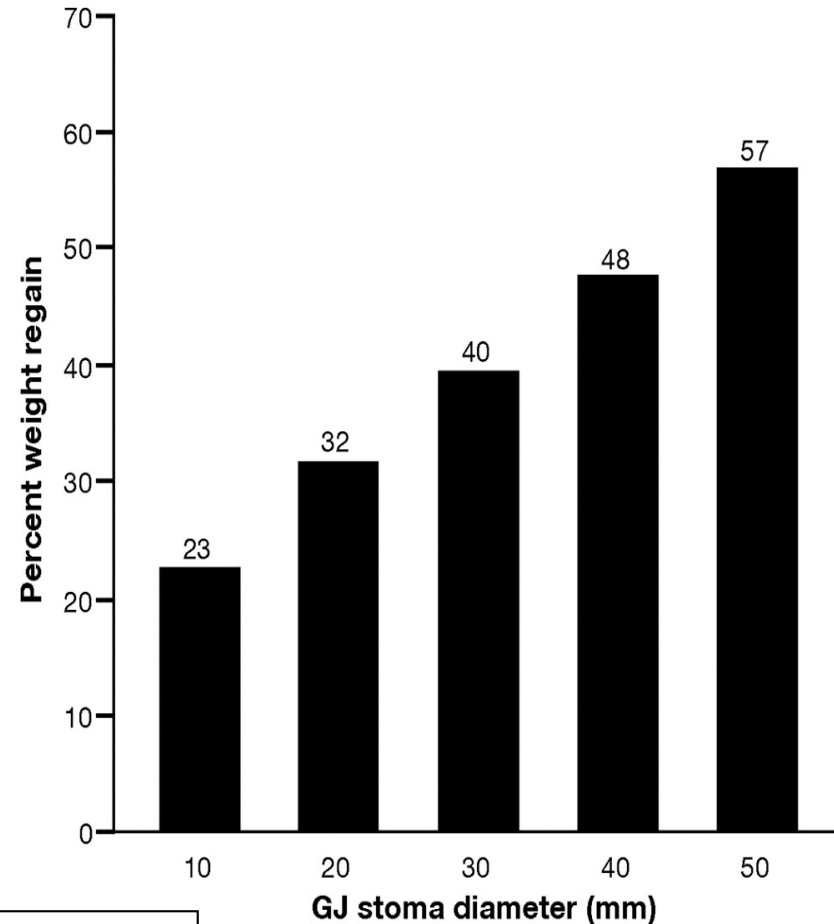
Received April 13, 2011; accepted September 13, 2011

2012



Weight regain and stoma diameter

Predicted percentage of maximal weight lost after RYGB that was regained in 5 years after the procedure at **different GJ stoma diameters** based on the linear regression model.



2011

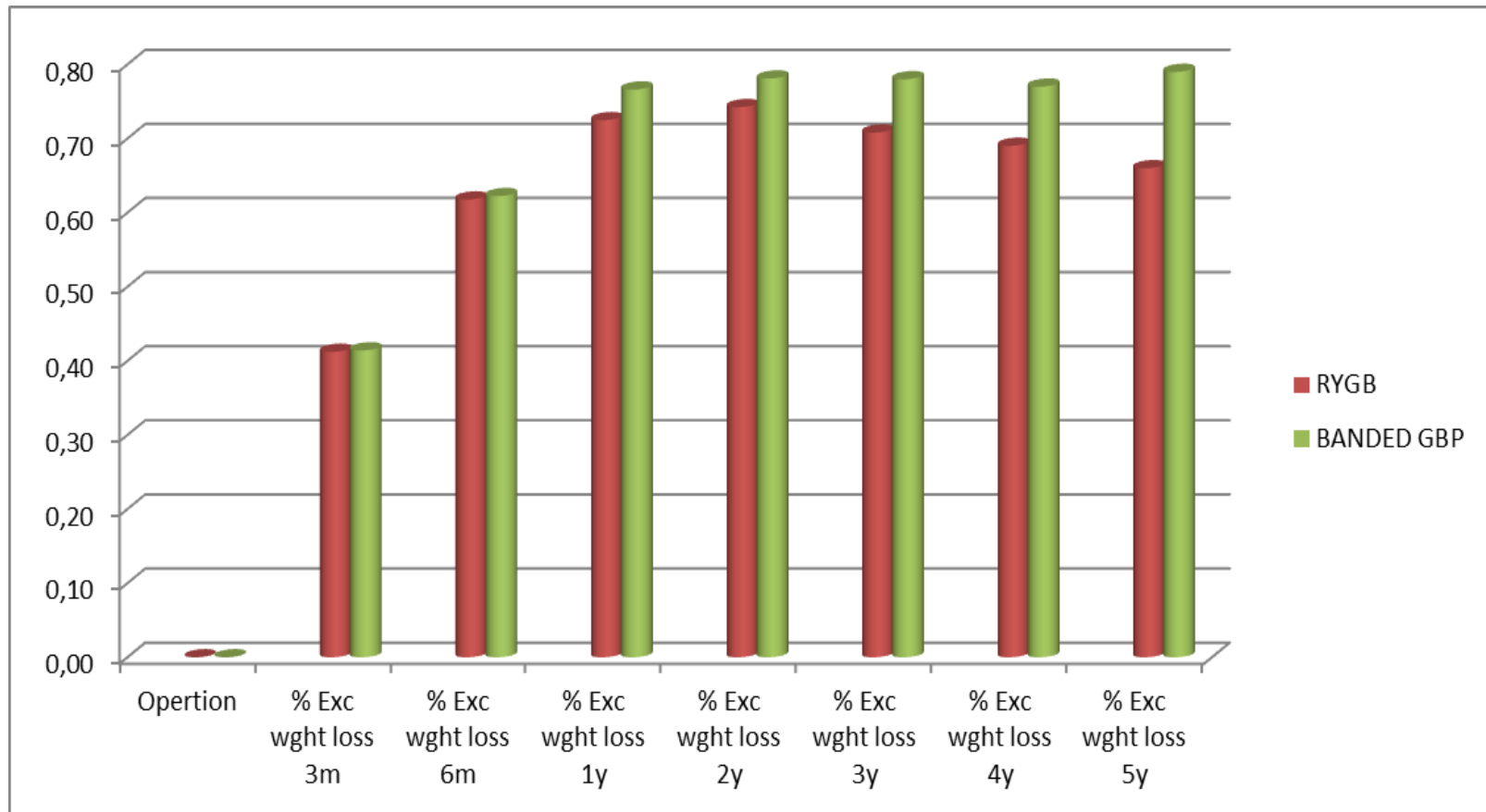


Gastrojejunal Stoma Diameter Predicts Weight Regain after Roux-en Y Gastric Bypass.
BKA Dayyeh, DB Lautz, CC Thompson
Clinical Gastroenterology and Hepatology **2011**; 9:228-233

Redo Surgery. Actual Trend

Surgical Options After RYGB

Banded/Non-Banded Gastric Bypass



Banded Gastric Bypass: Better Long Term Results? A cohort Study with Minimum 5 Year Follow-up
Luc Lemmens. *Obes Surg*, 2017; 27 (4): 864-872

BARIATRIC TIMES

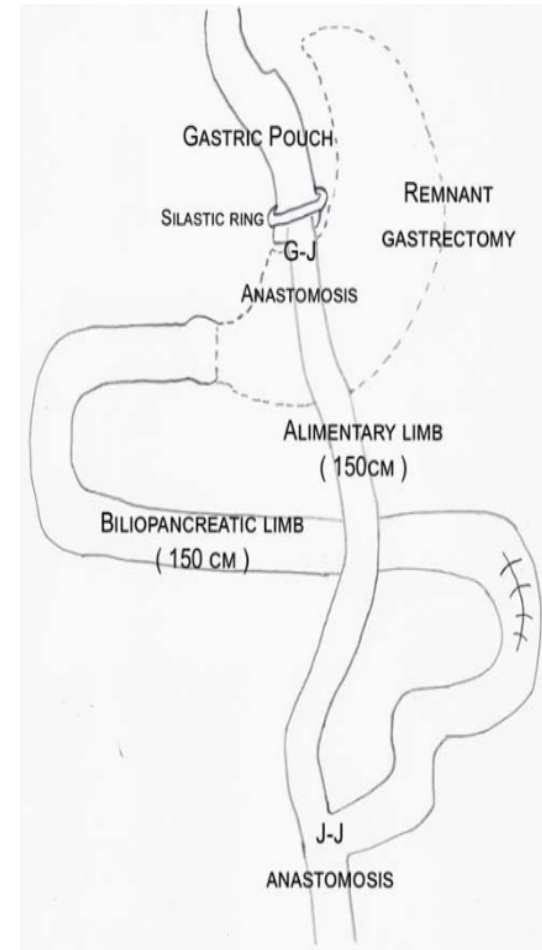
Clinical Developments and Metabolic Insights in Total Bariatric Patient Care

The Ultimate Revisional Laparoscopic Roux-en-Y Gastric Bypass Technique

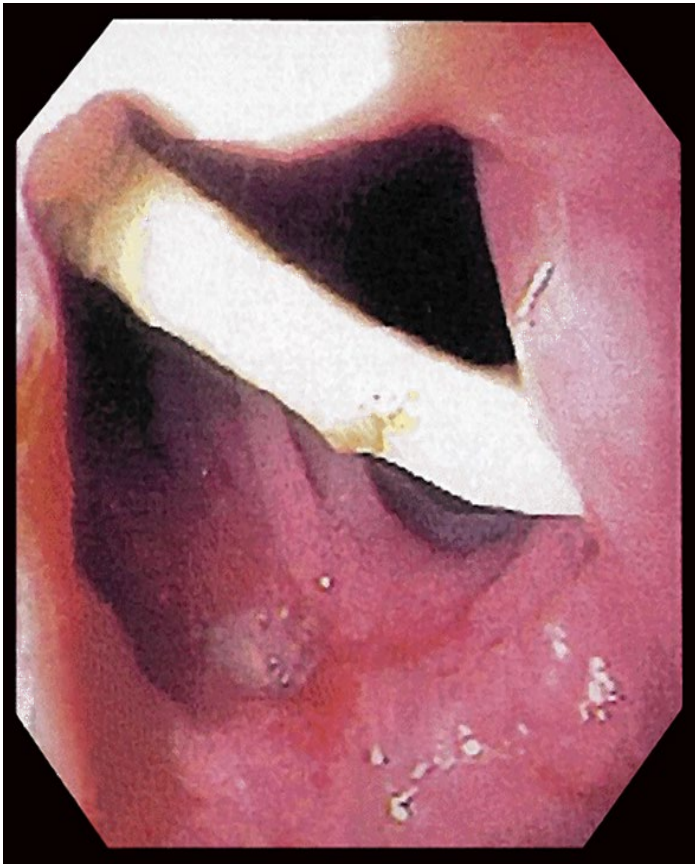
[BT Online Editor](#) | February 1, 2018

by Felipe Chaux, MD; Mauricio Franco, MD; and J. Esteban Varela, MD, FACS, FASMBS

Felipe Chaux, MD, Mauricio Franco, MD, and J. Esteban Varela, MD, FACS, FASMBS, are with the Diabetes Surgery Institute and Centro de Cirugia para la Obesidad in Bogota D.C., Colombia. Dr. Varela is also Chairman of Surgery at HCA and Professor of Surgery at the University of Central Florida in Orlando, Florida.



Banding the Gastric Bypass - Complications



Band erosion < 2%

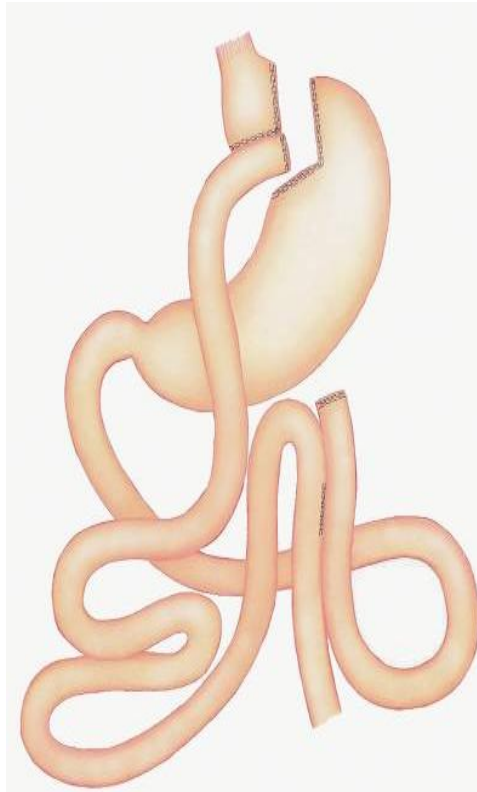
- Incidence directly related to infection
- Conservative treatment
- Endoscopic management when it occurs

Kinking or Slippage < 1%

- Functional Obstruction
- Adhesion to Liver
- Surgical removal and replacement

Solid Food intolerance < 5 %

- Nutritional counseling
- Band removal



Revision of a failed S-GBP to a 150 cm common tract D-GBP corrects failed weight loss and severe obesity comorbidity but requires nutritional support to prevent protein-calorie malnutrition, iron and fat-soluble vitamin deficiencies, and further revision in some patients to correct malnutrition.

A 50 cm common tract has an **unacceptable morbidity and mortality**

50-150 cm common channel

Conversion of proximal to distal gastric bypass for failed gastric bypass for superobesity.

Sugerman HJ¹, Kellum JM, DeMaria EJ.

J Gastrointest Surg. **1997** Nov-Dec;1(6):517-24; discussion 524-6.

Redo Surgery. Actual Trend



ELSEVIER



CrossMark

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

SURGERY FOR OBESITY
AND RELATED DISEASES



Original article

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

^aDepartment of Surgery, Yale School of Medicine, New Haven, CT

^bAdvanced Laparoscopy Surgery Associates, Fresno Heart and Surgical Hospital, Fresno, California, CA, and the Fresno Medical Education Program, University of California, San Francisco, SF

^cBon Secours St. Mary's Hospital, Richmond, Virginia

Received April 17, 2017; accepted January 8, 2018

2017

96pts

Conversion of proximal RYGB to distal RYGB results in substantial improvement in weight loss and resolution of *co-morbidities at 3 years* but the effect on calcium, parathyroid hormone, and the fat soluble vitamins A and D is still a major concern.

Table 2

Outcomes in the subgroup of 11 patients who were super-obese before distalization using total alimentary limb length (TALL) of 400 to 450 cm

	BMI kg/m ²	Range	%EWL	%TWL	Δ BMI	Follow-up (%)
Index RYGB	60.4 ± 6.8	50.6–71.3	–	–	–	–
At distalization	54.6 ± 5.1	50.1–64.9	16.6 ± 12.9	–	–	–
30 d postdistalization	51.4 ± 5.3	46.7–63.1	11.0 ± 4.1	5.9 ± 2.1	3.2 ± 1.1	11/11 (100)
6 mo postdistalization	46.2 ± 3.3	39.5–49.8	27.1 ± 10.5	14.7 ± 5.9	8.1 ± 3.5	8/9 (88.9)
1 yr postdistalization	46.1 ± .9	45.0–47.3	29.0 ± 11.3	16.1 ± 7.3	9.2 ± 4.9	6/7 (85.7)
2 yr postdistalization	46.3 ± 2.2	44.7–47.9	25.0 ± 1.3	13.3 ± 1.3	7.1 ± 1.2	2/4 (50)
3 yr postdistalization	44.5 ± 6.0	40.3–48.7	32.0 ± 12.7	16.8 ± 5.8	8.9 ± 2.5	2/4 (50)

BMI = body mass index; %EWL = percent excess weight loss; %TWL = %total weight loss; RYGB = Roux-en-Y gastric bypass.

SAGES Guidelines Committee endorsed by the ASMBS

Several authors have addressed the issue of limb length during RGB.

- In BMI ≤ 50 kg/m² patients, both retrospective ^[160] and prospective ^[161, 162] data **fail to show** a benefit for alimentary limbs longer than 150 cm.
- BMI >50 kg/m² patients who were randomized to a 250 cm rather than a 150 cm alimentary limb did show improved weight loss at 18 months, though the study was **not powered to confirm this benefit** at longer follow-up ^[162].
- Other studies have examined the use of alimentary limbs longer than 300 cm for BMI > 50 kg/m² patients, and have found improved weight loss over standard RGB, but with **increased nutritional deficiencies and need for reoperation**

Redo Surgery. Actual Trend

RYGB - Conversion to DS



ELSEVIER



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Surgery for Obesity and Related Diseases 12 (2016) 1671–1680

SURGERY FOR OBESITY
AND RELATED DISEASES

Original article

One-stage conversion of Roux-en-Y gastric bypass to a modified biliopancreatic diversion with duodenal switch using a hybrid sleeve concept

Philippe Topart, M.D.* , Guillaume Becouarn, M.D.

Société de Chirurgie Viscérale, Clinique de l'Anjou, Angers, France

Received November 10, 2015; accepted February 17, 2016



ELSEVIER



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Surgery for Obesity and Related Diseases 13 (2017) 1272–1277

SURGERY FOR OBESITY
AND RELATED DISEASES

Original article

Conversion of failed Roux-en-Y gastric bypass to biliopancreatic diversion with duodenal switch: outcomes of 9 case series

Hamzeh M. Halawani, M.D., F.E.B.S.* , Fernando Bonanni, M.D., F.A.S.M.B.S.,
Abraham Betancourt, M.D., Gintaras Antanavicius, M.D., F.A.S.M.B.S.

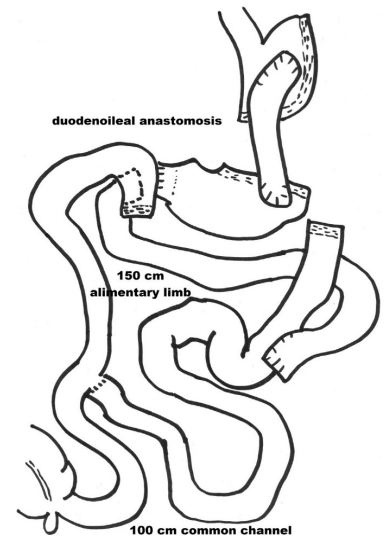
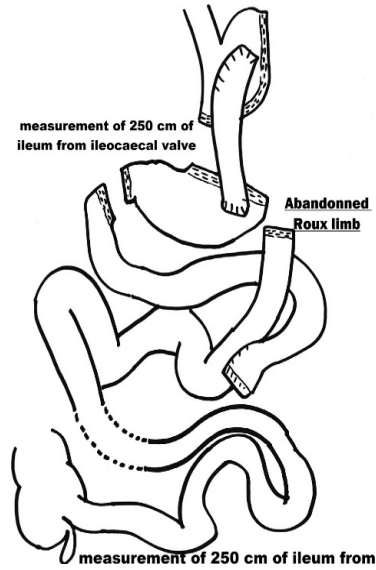
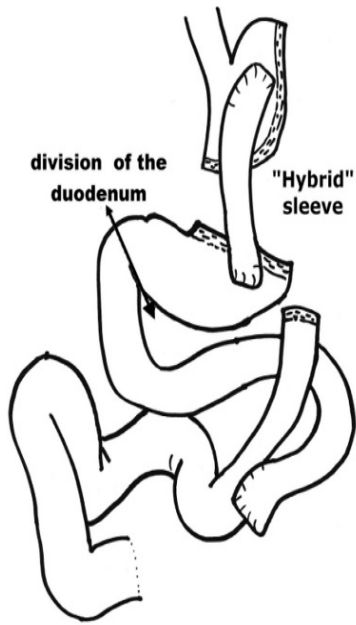
Department of Surgery, Abington - Jefferson Health – Institute of Bariatric and Metabolic Surgery, Abington, Pennsylvania

Received April 14, 2017; accepted April 18, 2017



Redo Surgery. Actual Trend

RYGB - Conversion to DS



Obesity Surgery (2022) 32:3194–3204
<https://doi.org/10.1007/s11695-022-06174-x>



NEW CONCEPT



Single Anastomosis Jejunio-ileal (SAJI): a New Model of Malabsorptive Revisional Procedure for Insufficient Weight Loss or Weight Regain After Roux-en-Y Gastric Bypass

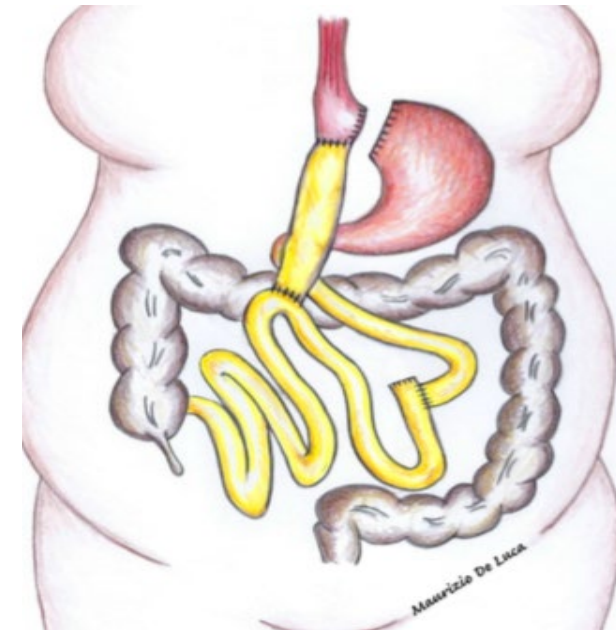
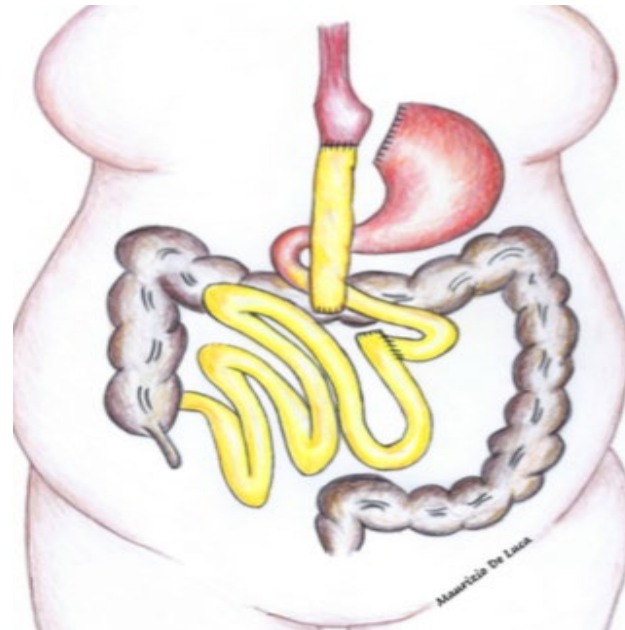
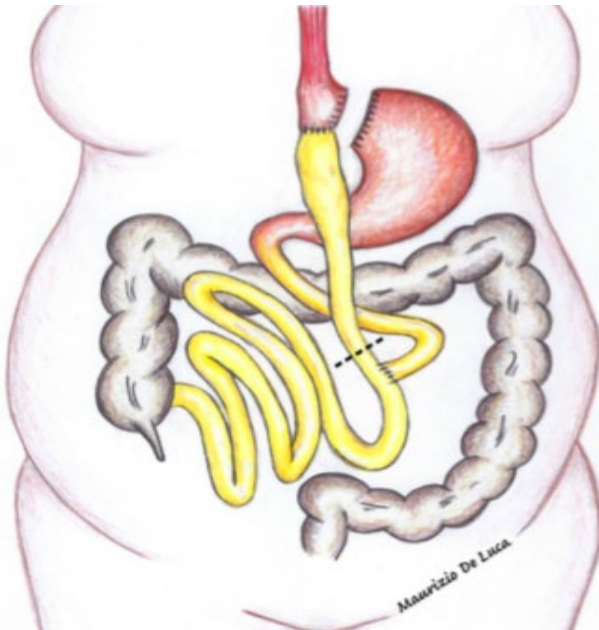
Maurizio De Luca¹  · Giacomo Piatto² · Alberto Sartori² · Monica Zese³ · Cesare Lunardi² · Simone Targa⁴ · Cristiano Giardiello⁵ · Paolo Gentileschi⁶ · Jacques Himpens⁷

Received: 23 July 2021 / Revised: 13 March 2022 / Accepted: 18 March 2022 / Published online: 28 June 2022
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Redo Surgery. Actual Trend

Single Anastomosis Jejunio-Ileal (SAJI)

Simple malabsorptive revisional surgery for insufficient weight loss or weight regain after roux-en y gastric bypass

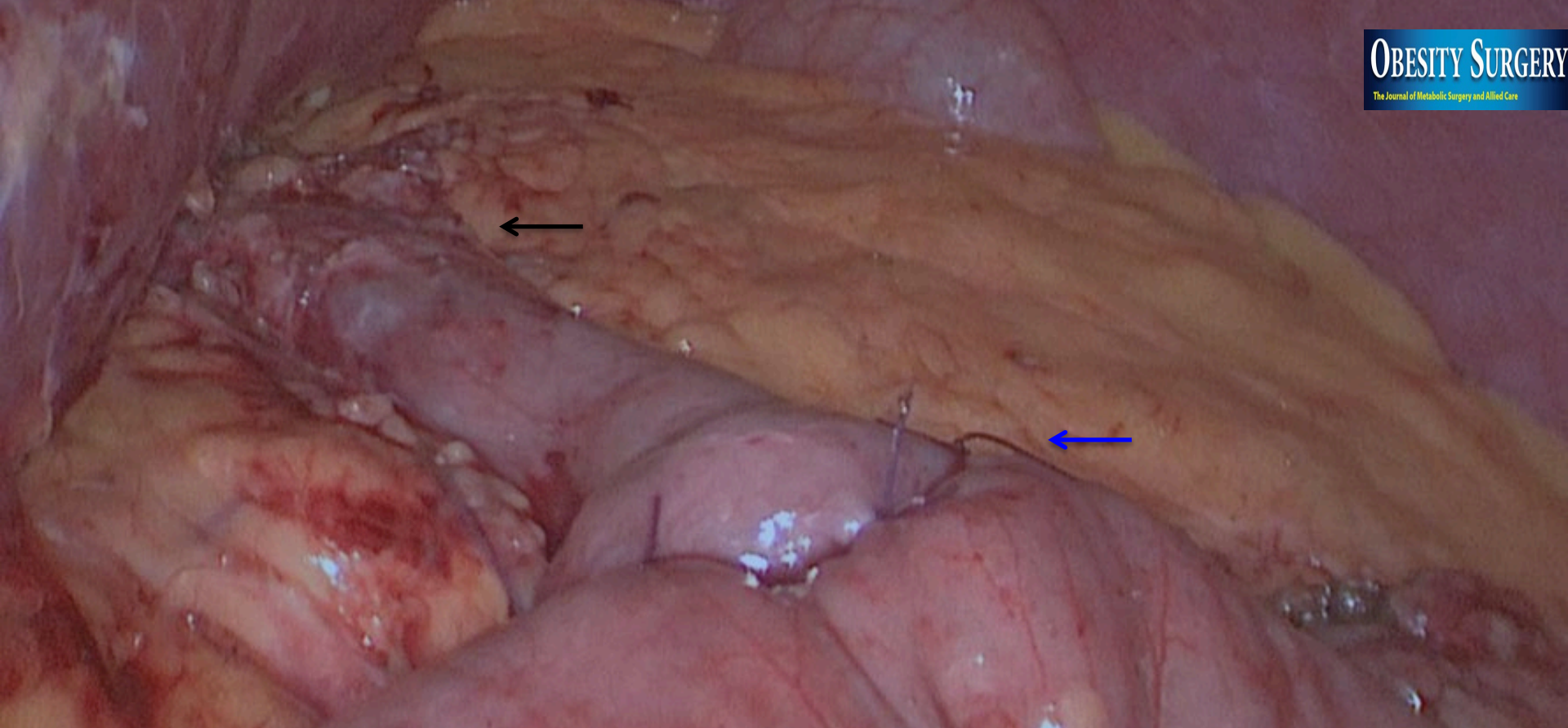


Roux-en Y Gastric Bypass

Transection on the alimentary limb at 30 cm from gastro-jejunal anastomosis

Jejunio-ileal anastomosis 250-300 cm proximal to the ileocecal valve (ileal) and 30 cm distal from the gastro-jejunal anastomosis on the alimentary limb of the gastric bypass (jejunal)

One Anastomosis Jejunio-Ileal (SAJI)



- ← Gastro-jejunal anastomosis of Roux-en Y Gastric Bypass
- ← Jejunio-ileal anastomosis specifically 250-300 cm proximal to the ileocecal valve (ileal) and minimum 30 cm distal from the gastro-jejunal anastomosis on the alimentary limb of the gastric bypass (jejunal)

Table 5
Weight loss outcomes

	RYGB	SAJI	1 yr	2 yr	3 yr	4 yr
Eligible patient, n	31	31	28	23	5	2
Data available, n	31	31	26	20	5	2
Follow up, %	100%	100%	93.2%	86.9%	100%	100%
BMI, kg/m ²	46.1±6.7	38.1±10.2	31.9±8.1	29.7±7.1	28.5±5.3	30.5±6.4
Change in BMI, kg/m ²	-	8.0±9.2	14.2±7.7	16.4±7.4	17.6±5.2	15.6±4.7
%EWL	-	44.1±8.9	56.6±7.7	63.3±6.7	68.6±5.8	66.0±5.9
%TWL	-	21.8±7.8	27.2±7.4	31.2±6.4	33.7±5.9	32.9±5.2

BMI: Body Mass Index; %EWL: percent excess weight loss; %TWL: percent total weight loss.

*Value expressed as mean ± standard deviation (median)

Single Anstomosis Jejuno-Ileal (SAJI): A New Model Of Malabsorptive Revisional Procedure For Insufficient Weight Loss or Weight Regain After Roux-en-y Gastric Bypass.

Maurizio De Luca, Giacomo Piatto, Alberto Sartori, Monica Zese, Cesare Lunardi, Simone Targa, Cristiano Giardiello, Paolo Gentileschi, Jacques Himpens

Obesity Surgery, 2022, <https://doi.org/10.1007/s11695-022-06174-x>

Redo Surgery. Actual Trend

Surgical Options After RYGB



Table 3
Peri-operative (30 days) complications

Complications	Clavien-Dindo Classification Grade						
	N (%)	I, n (%)	II, n (%)	III A, n (%)	III B, n (%)	IV, n (%)	V, n (%)
Nausea	3	1	2				
Vomiting	1		1				
Diarrhea (>2 per day)	2	2					
Constipation	1		1				
Postoperative bleeding	1	1					
Hematemesis and hematochezia	1	1					
Intrabdominal abscess	1		1				
Dehydration	1		1				
Incisional hernia (36 days post-op)	1				1 (36 days post-op)		
Mortality	0						
Total, n (%)	12 (37.2)	5 (16.1)	6 (19.3)	-	1 (3.2)	-	-

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Redo Surgery. Actual Trend

Surgical Options After RYGB



Table 4
Medium term complications (48 months)

Complications (23 pts at 24 months)	Clavien-Dindo Classification Grade						
	n (%)*	I, n (%)	II, n (%)	III A, n (%)	III B, n (%)	IV, n (%)	V, n (%)
Nausea	3		3				
Diarrhea (>2 per day)	2	1	1				
Constipation	1		1				
Cholelithiasis	2	2					
Malnutrition	1		1				
Hypoproteinemia	1		1				
Dehydration	1		1				
Abdominal pain (adhesions)	1		1				
Inadequate weight loss	2						
Total, n (%)	14 (50.0)	3 (10.7)	9 (32.1)	-	-	-	-

**26 patients at 12 months follow up, 20 patients at 24 months follow up, 5 patients at 36 months follow up, 2 patients at 48 months follow up
Three patients lost at follow up*

Single Anstomosis Jejunum-Ileal (SAJI): A New Model Of Malabsorptive Revisional Procedure For Insufficient Weight Loss or Weight Regain After Roux-en-y Gastric Bypass.

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Table 6
Remission of comorbidities

Obesity related comorbidities	RYGB (%)	SAJI (%)*	R (%)	Postoperative		
				I (%)	N (%)	W (%)
T2DM	12 (38.7%)	1 (8.3%) – 2 (16.6%)*	5 (41.6%)	5 (41.6%)	1 (8.3%)	-
AHT	14 (45.1%)	3 (21.4%) - 2 (14.2%)*	3 (21.4%)	3 (21.4%)	4 (28.5%)	1 (7.1%)
DS	11 (35.4%)	1 (9.1%) – 1 (9.1%)*	5 (45.5%)	3 (27.3%)	2 (18.1%)	-
OSA	11 (35.4%)	4 (36.3%)	2 (18.1%)**	3 (27.2%)**	1 (9.1%) ³	1 (9.1%)

R: resolved; I:improved; N:neutral; W:worsened.

T2DM: Type 2 Diabetes Mellitus; AHT: Arterial Hypertension; DS: Dyslipidemia; OSA: Obstrutive Sleep Apnea

*At time of SAJI, regarding T2DM 1 out 12 patients discontinued medications and 2 out 12 patients reduced medications; regarding AHT, 3 out 14 patients discontinued medications and 2 out 14 patients reduced medications; regarding DS, 1 out 11 patients discontinued medications and 1 out 11 patients reduced medications; regarding OSA, 4 out 11 patients no longer required CPAP.

**OSA was resolved (removed C PAP or B PAP) in 2 out 11 patients (18.1%), improved (reduced C PAP or B PAP flows and times of use) in 3 out 11 patients (27.2%).

Single Anstomosis Jejun-Ileal (SAJI): A New Model Of Malabsorptive Revisional Procedure For Insufficient Weight Loss or Weight Regain After Roux-en-y Gastric Bypass.

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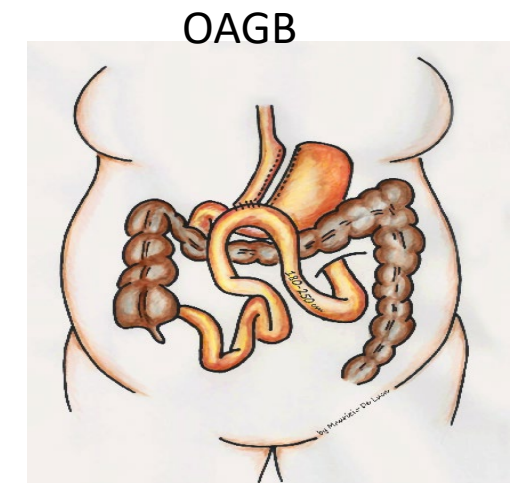
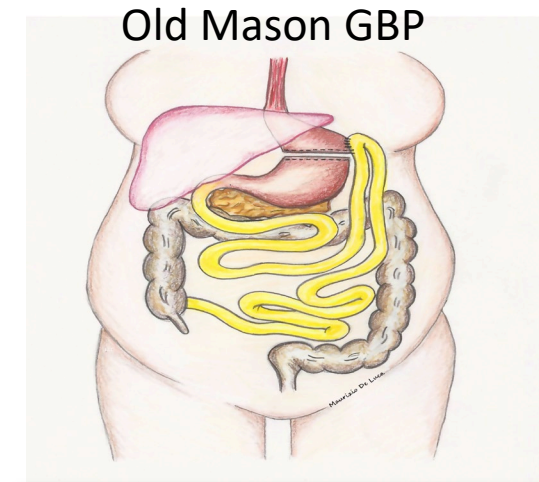
- Fallimento dopo Bendaggio Gastrico Regolabile
- Fallimento dopo Sleeve Gastrectomy
- Fallimento dopo Bypass Gastrico
- **Fallimento dopo OAGB/MGB**
- Fallimento dopo BPD-DS

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OAGB

The **OAGB/MGB** combines two major components:

- 1) First is a long **non-obstrutive gastric tube** (Collis Gastroplasty), sized equal to the diameter of the esophagus that rapidly delivers undigested food through the **non-obstrutive wide gastro-jejunostomy** into the distal jejunum. This results in an exaggerated “**Post-Gastrectomy Syndrome (PGS)**” that restricts the intake of food (without “obstruction”), limits the intake of sugars, fat and large food boluses, but allows each of these in moderation.
- 1) The PGS results in alteraion of intestinal transit time, reduced acid secretion, bloating, decreased appetite, and consequently decreased caloric intake.
- 1) The other component of the OAGB/MGB is a **moderate malabsorption** due to the bilio-pancreatic limb (150 - 250 cm) combined with a Billroth II gastro-jejunostomy that results in significantly more fat malabsorption and fatty food intolerance than RNY.



Maurizio De Luca

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Surg Clin North Am.1992 Apr;72(2):445-65.

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Obes Surg. 2018 May;28(5):1188-1206.

Mini Gastric Bypass-One Anastomosis Gastric Bypass (MGB-OAGB)

IFSO Position Statement

Obesity Surgery, May 2018, Vol 28, 5, 1188-1206



Background

- **MGB** consists of a lesser curvature-based long-sleeved gastric pouch starting 2–3 cm below the level of the crow's foot and extending proximally slightly to the left of the angle of His. An antecolic 3–5 cm wide anastomosis is then constructed between the pouch and the jejunum, about 180–220 cm distal to Treitz' ligament. In the super obese, the distance to Treitz' ligament would be about 250 cm, in the elderly or vegetarians 180–200 cm and in type II diabetics without major obesity about 150 cm [2].
- In 2002, Carbajo and Caballero (Spain) proposed a technical variation to prevent gastroesophageal (GE) bile reflux. They called their technique One Anastomosis Gastric Bypass (**OAGB**) or in spanish Bypass Gastrico de Una Anastomosis (BAGUA). According to this technique, OAGB has a latero-lateral anastomosis between the loop of jejunum and the pouch, and the distance to Treitz' ligament averages 250–350 cm [3].

2 Rutledge R. The mini-gastric bypass: experience with the first 1, 274 cases. *Obes Surg.* 2001;11(3):276–80.

3 Carbajo M, García-Caballero M, Toledano M, et al. One- anastomosis gastric bypass by laparoscopy: results of the first 209 patients. *Obes Surg.* 2005;15(3):398–404.



FALLIMENTO DOPO OAGB

- descritti casi di fallimento in termini di weight regain
- descritti casi di fallimento intesi come malnutrizione severa ed insufficienza epatica, talora fatali (1 case report)
- va inteso come fallimento la presenza di reflusso biliare invalidante

Mini Gastric Bypass-One Anastomosis Gastric Bypass (MGB-OAGB)-IFSO Position Statement

De Luca M et al,
Obes Surg. 2018 May;28(5):1188-1206.

IFSO Update Position Statement on One Anastomosis Gastric Bypass (OAGB)

M De Luca, G Piatto, G Merola, J Himpens, JM Chevallier , MA Carbajo , K Mahawar, A Sartori, N Clemente, M Herrera, K Higa, WA Brown, S Shikora
Obes Surg 2021 Jul;31(7):3251-3278.

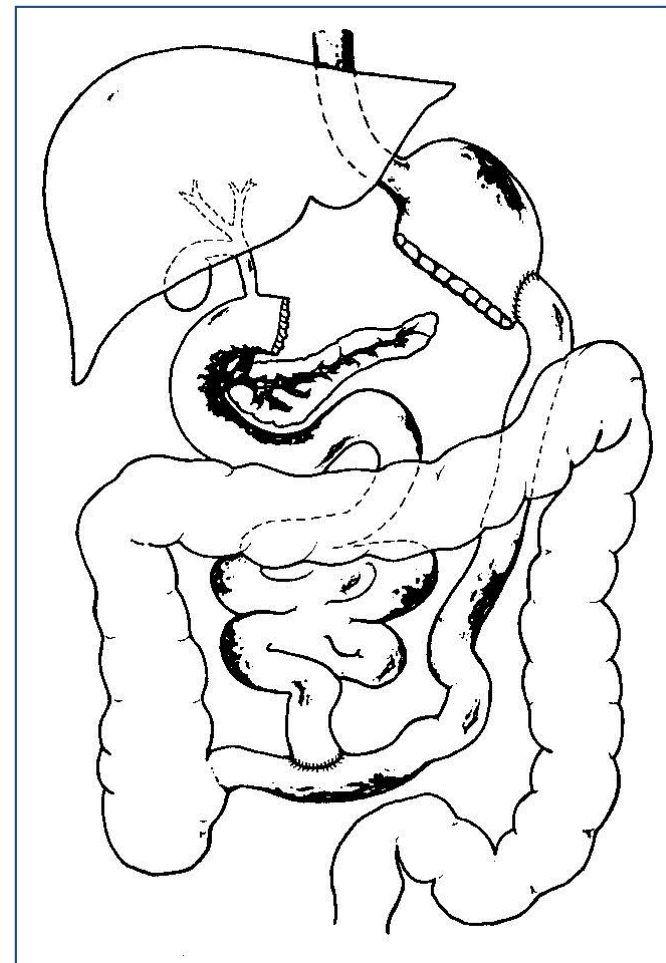
- Introduzione
- Fallimento dopo Bendaggio Gastrico Regolabile
- Fallimento dopo Sleeve Gastrectomy
- Fallimento dopo Bypass Gastrico
- Fallimento dopo mini bypass gastrico
- Fallimento dopo Standard BPD e BPD-DS

FALLIMENTO DOPO DBP E DBP/DS

Diversione Biliopancreatica

BilioPancreatica Diversion (Scopinaro 1988)

- **distal gastrectomy**
- **gastric reservoir 200-300 ml**
- **common channel 50 cm**
- **alimentary channel 200 cm**

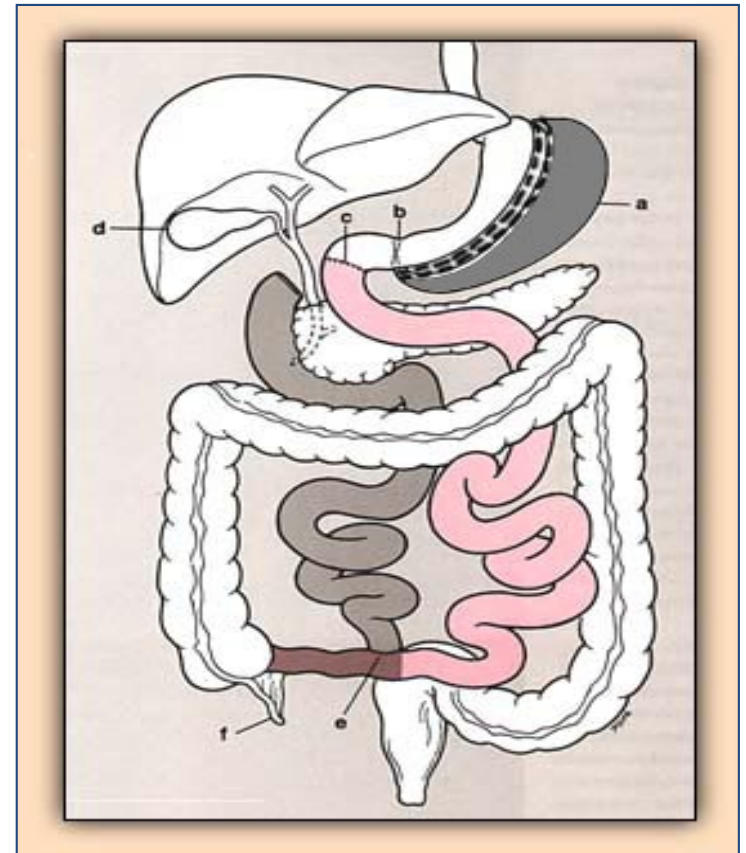


FALLIMENTO DOPO DBP E DBP/DS

Duodenal Switch

BilioPancreatica Diversion Duodenal Switch (Hess 1988)

- vertical gastrectomy
- gastric reservoir 150-200 ml
- duodenal switch
- common channel 100cm
- alimentary channel 150 cm



FALLIMENTO DOPO DBP E DBP/DS

- raro (<3%) il mancato calo ponderale o il fallimento in termini di miglioramento delle comorbidità
- fallimento in termini di **grave malnutrizione** (riportati casi di trapianto di fegato per insufficienza epatica post-DS)
- fallimento in termini di grave peggioramento della **QoL (diarrea, sudorazione acida, alitosi, fatigue, patologia proctologica)**

Post-bariatric surgery follow-up

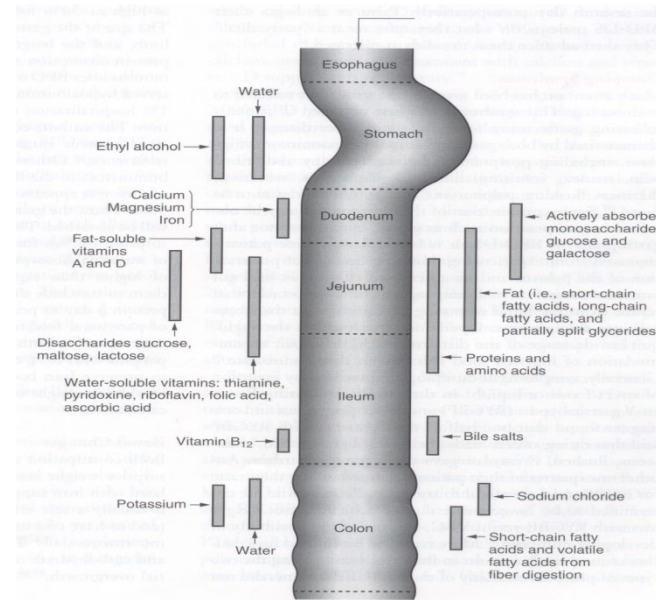
Table 5. Major vitamins and minerals deficiencies after bariatric surgery: clinical manifestations and estimated frequency according to the bariatric procedure

Deficiency	Key clinical manifestations	Procedure-related frequency
Iron	microcytic anaemia	AGB + SG ++ RYGB, BPD, BPD/DS +++
Vitamin B12	megaloblastic anaemia neurologic abnormalities	SG, RYGB, BPD, BPD/DS ++
Vitamin D (and calcium)	bone demineralization increased risk of fractures	RYGB ++ BPD, BPD/DS +++
Vitamin A	ocular xerosis night blindness symptoms	BPD, BPD/DS +++
Vitamin E	anaemia ophthalmoplegia peripheral neuropathy	BPD, BPD/DS +++
Vitamin K	easy bleeding	BPD, BPD/DS +

AGB = Adjustable gastric banding; SG = sleeve gastrectomy; RYGB = gastric bypass; BPD = biliopancreatic diversion; BPD/DS = biliopancreatic diversion with duodenal switch.

Nutrients Most at Risk

- ◆ Iron
- ◆ Calcium
- ◆ Zinc
- ◆ Vitamin D
- ◆ Vitamin A
- ◆ Vitamin K
- ◆ Protein



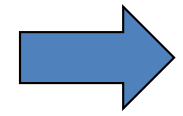
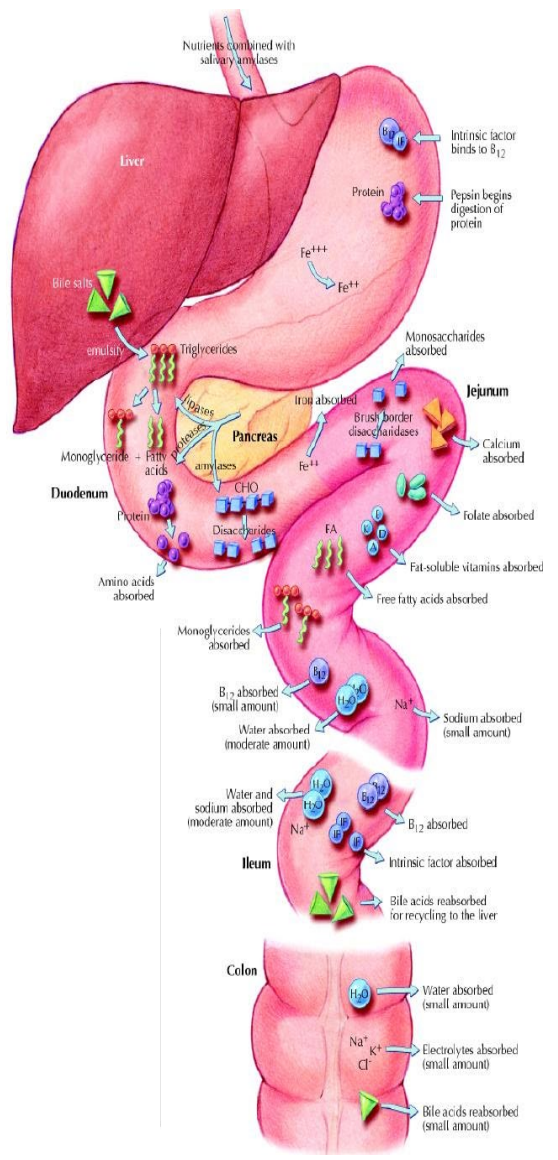
Dolen K et al. A clinical and nutritional comparison of biliopancreatic diversion with and without duodenal switch. *Ann Surg* 2004; 240-51

Slater GH, Serum fat-soluble vitamin deficiency and abnormal calcium metabolism after malabsorptive bariatric surgery. *J Gastrointestinal Surg* 2004; 8: 48-65

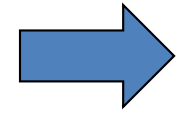
Gagner M. *Laparoscopic revisional surgery after malabsorptive procedures in bariatric surgery, more specifically after duodenal switch.* *Surg Laparosc Endosc Perc Tech* 2010;20:344-7.

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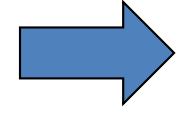
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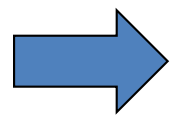
LSG



RYGB



OAGB



BPD/DS

Post-bariatric surgery follow-up

Table 6. Minimal periodic surveillance for nutritional deficiencies after bariatric surgery

	AGB	SG	RYGB	BPD - BPD/DS
Timing	every 6 months in the first year every 12 months thereafter	every 3-6 months in the first year every 12 months thereafter	every 3-6 months in the first year every 12 months thereafter	every 3 months in the first year every 6-12 months thereafter
Assessment	CBC, platelets electrolytes iron, ferritine vitamin B12 folate vitamin D PTH	CBC, platelets electrolytes iron, ferritine vitamin B12 folate vitamin D PTH	CBC, platelets Electrolytes iron, ferritine vitamin B12 folate vitamin D PTH 24-H U-calcium osteocalcin	CBC, platelets electrolytes iron, ferritine vitamin B12 folate vitamin D PTH 24-H U-calcium osteocalcin vitamin A vitamin E INR albumin prealbumin

AGB = Adjustable gastric banding; SG = sleeve gastrectomy; RYGB = gastric bypass; BPD = biliopancreatic diversion; BPD/DS = biliopancreatic diversion with duodenal switch. CBC = complete blood count; PTH = intact parathyroid hormone; 24-H U-calcium = 24-hour urinary calcium (modified [39]).

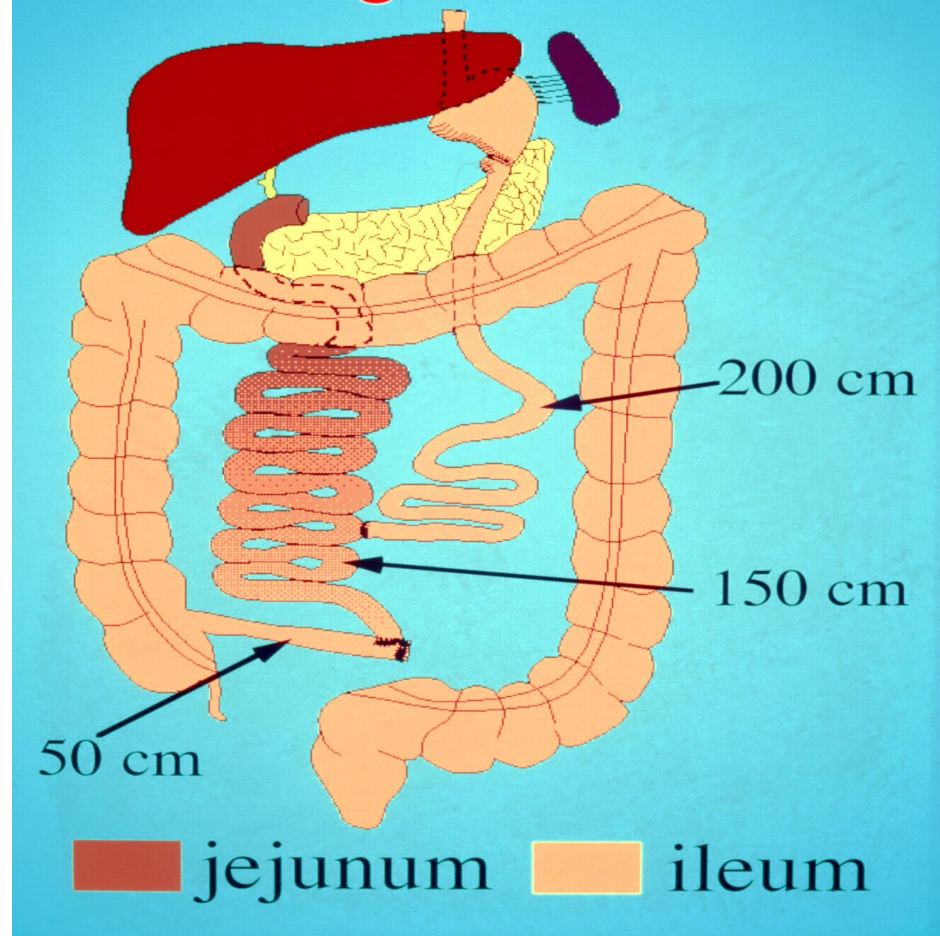
Obesity Facts
The European Journal of Obesity

Obes Facts 2017;10:597-632

Proteic Malnutrition

Normal amount of Food Intake

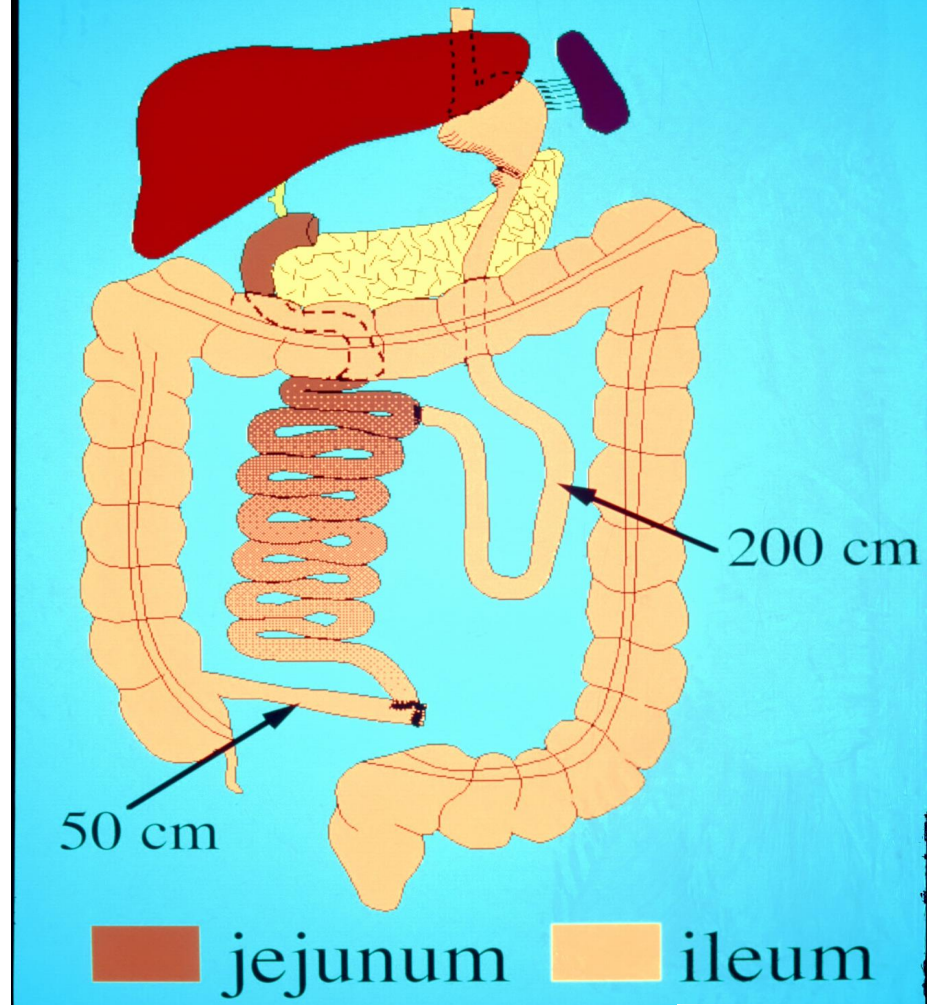
Elongation of the CL along the BPL



Proteic Malnutrition

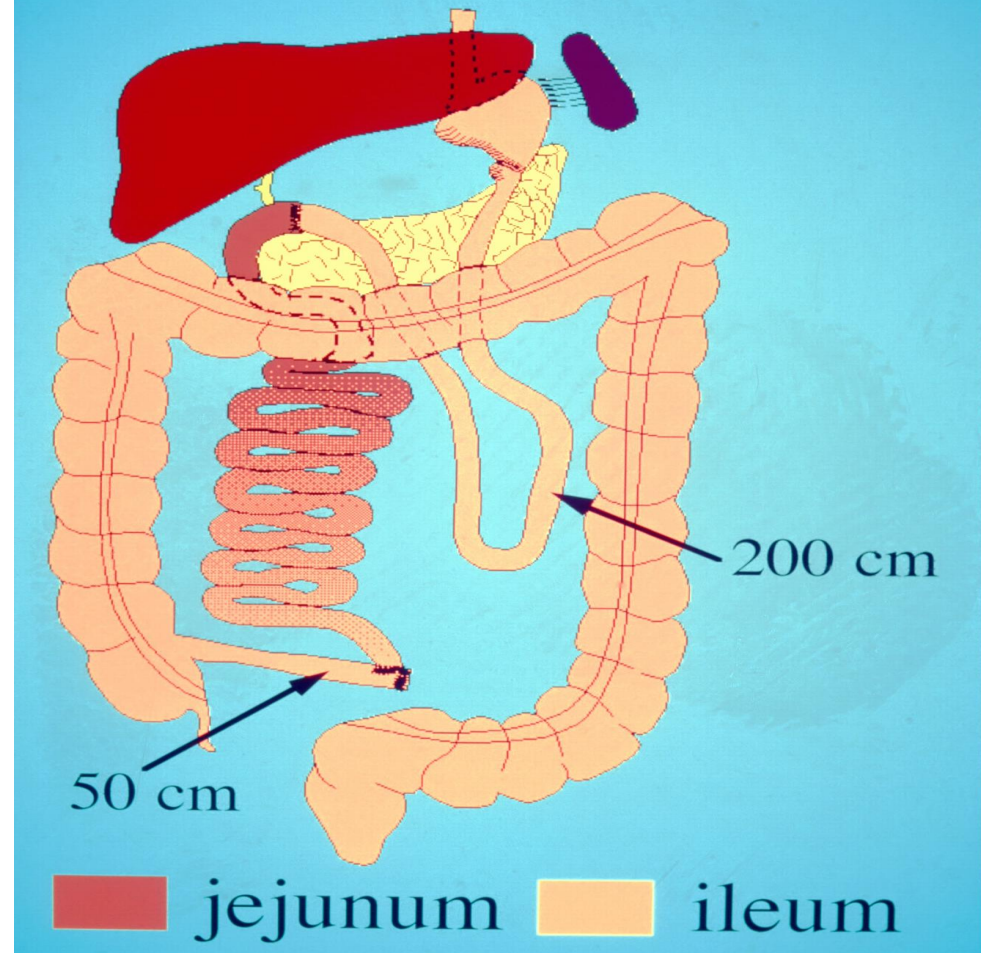
Reduced amount of Food Intake

Restoration bringing the AL to the ligament of Treitz



**Proteic Malnutrition
and
Bone Demineralization**

Restoration in presence of bone demineralization



DIARREA

perdita eccessiva di sali biliari
(risolta dalla colestiramina)

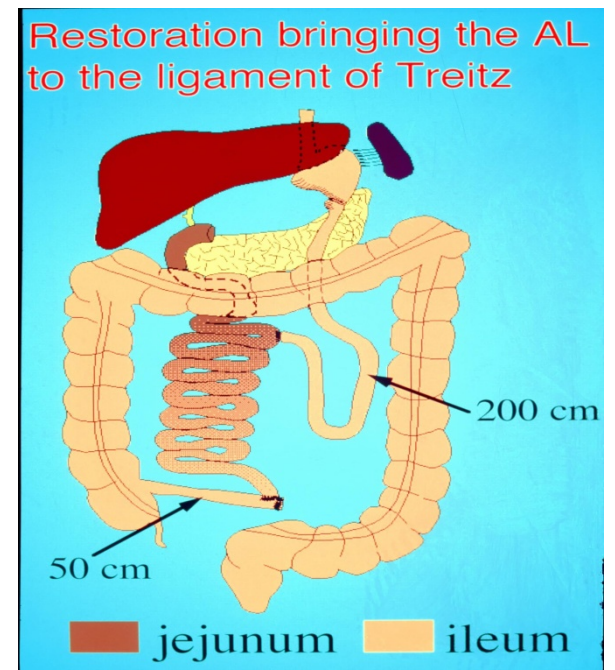
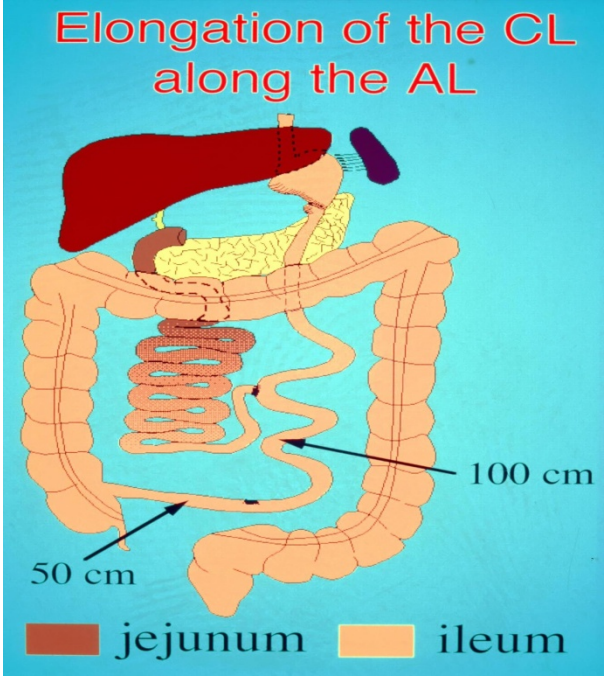
eccessivo introito o
malassorbimento idrico

allungamento
lungo il TA
4% delle REV

allungamento lungo
il TBP o
restaurazione al
Tritz
12% delle REV

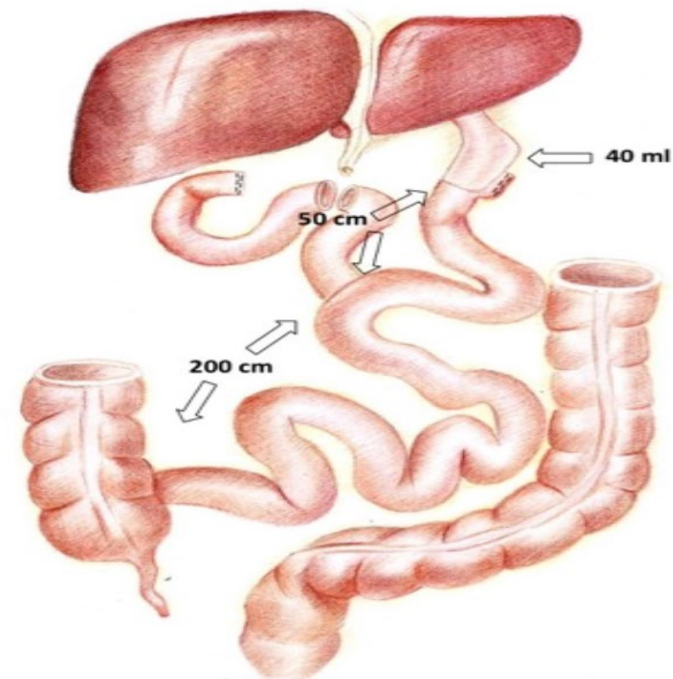
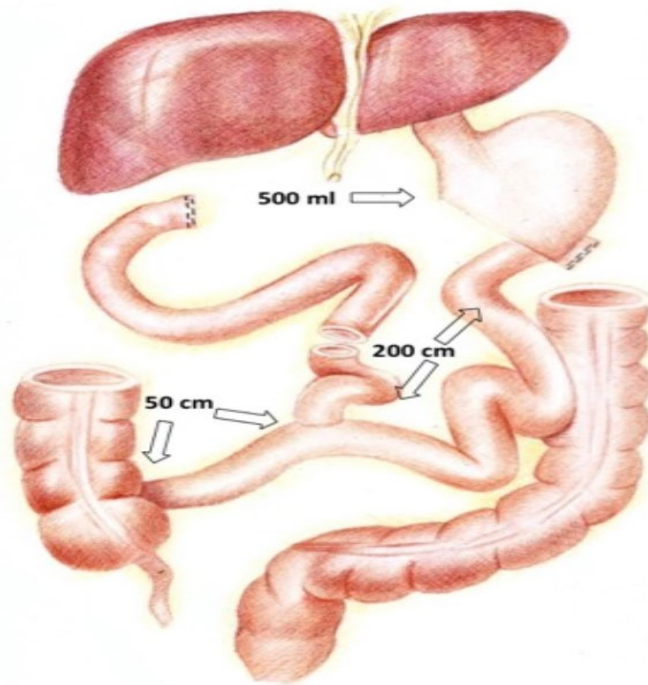
scomparsa della
diarrea e
minimo aumento
di peso

scomparsa della diarrea ma
fallimento in termini di peso



Ceriani operation

- Long Common Limb Revisional Biliopancreatic Diversion (**LCL-R-BPD**)
- risoluzione degli effetti collaterali avversi (**fallimento QOL**) della diversione classica (sequele proctologiche, malnutrizione)
- ansa alimentare “attiva” di 250 cm, di cui 200 cm di comune, associata a una tasca gastrica di 40 ml



Take home message 1

-
- Obesità è una malattia che dura **tutta la vita**
 - Fondamentale è l'adeguata **selezione** dei pazienti
 - Fondamentale è l'adeguata **informazione** ai pazienti
 - Non esiste un intervento per tutti i pazienti

Take home message 2

- Una inadeguata selezione porta inevitabilmente al **fallimento**
- Una inadeguata informazione porta inevitabilmente al **fallimento**
- Se l'intervento fallisce: **esame di coscienza**
- Fondamentale rivalutazione psicologica/psichiatrica

Take home message 3

- Per ciascun fallimento, **molteplici opzioni terapeutiche**, mirate per ciascun paziente
- Non sempre la revisione/conversione chirurgica è la migliore risposta
- Fondamentale garantire un **follow-up** adeguato:
 - Nutrizionistico
 - Psicologico

Limits: in questa relazione non è stato trattato il ruolo di: farmaci, endoscopia, megneti

«Un esperto è un
uomo che ha fatto
tutti gli errori che
è possibile
compiere in un
campo molto
ristretto»

Niels Bohr

Grazie

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