HUMANITAS
GAVAZZENI

ASPETTI NUTRIZIONALI POST CHIRURGIA

Il ruolo della tecnica chirurgica nel ridurre i rischi nutrizionali

Giuseppe M Marinari
Responsabile UF Chirurgia Bariatrica
Humanitas gavazzeni, Bergamo

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DEFICIT NUTRIZIONALI

1. Proteine
2. Vitamine liposolubili
3. Vitamine idrosolubili
4. Minerali (calcio, ferro, iodio, magnesio, zinco, rame, selenio…)

DEFICIT NUTRIZIONALI

REVIEWS

Nutritional deficiencies after bariatric surgery

Bikram S. Bal, Frederick C. Finelli, Timothy R. Shope and Timothy R. Koch

Abstract | Lifestyle intervention programmes often produce insufficient weight loss and poor weight loss maintenance. As a result, an increasing number of patients with obesity and related comorbidities undergo bariatric surgery, which includes approaches such as the adjustable gastric band or the 'divided' Roux-en-Y gastric bypass (RYGB). This Review summarizes the current knowledge on nutrient deficiencies that can

Bal, B. S. et al. Nat. Rev. Endocrinol. 8, 544–556 (2012)

Deficit proteine e vitamine liposolubili possibili quando tratto comune < 120 cm (BPD, BPD/DS, DRYGBP)

Deficit vitamine idrosolubili e minerali possibili dopo ogni tipo di intervento, ma la vitamina D può essere deficitaria anche dopo SG

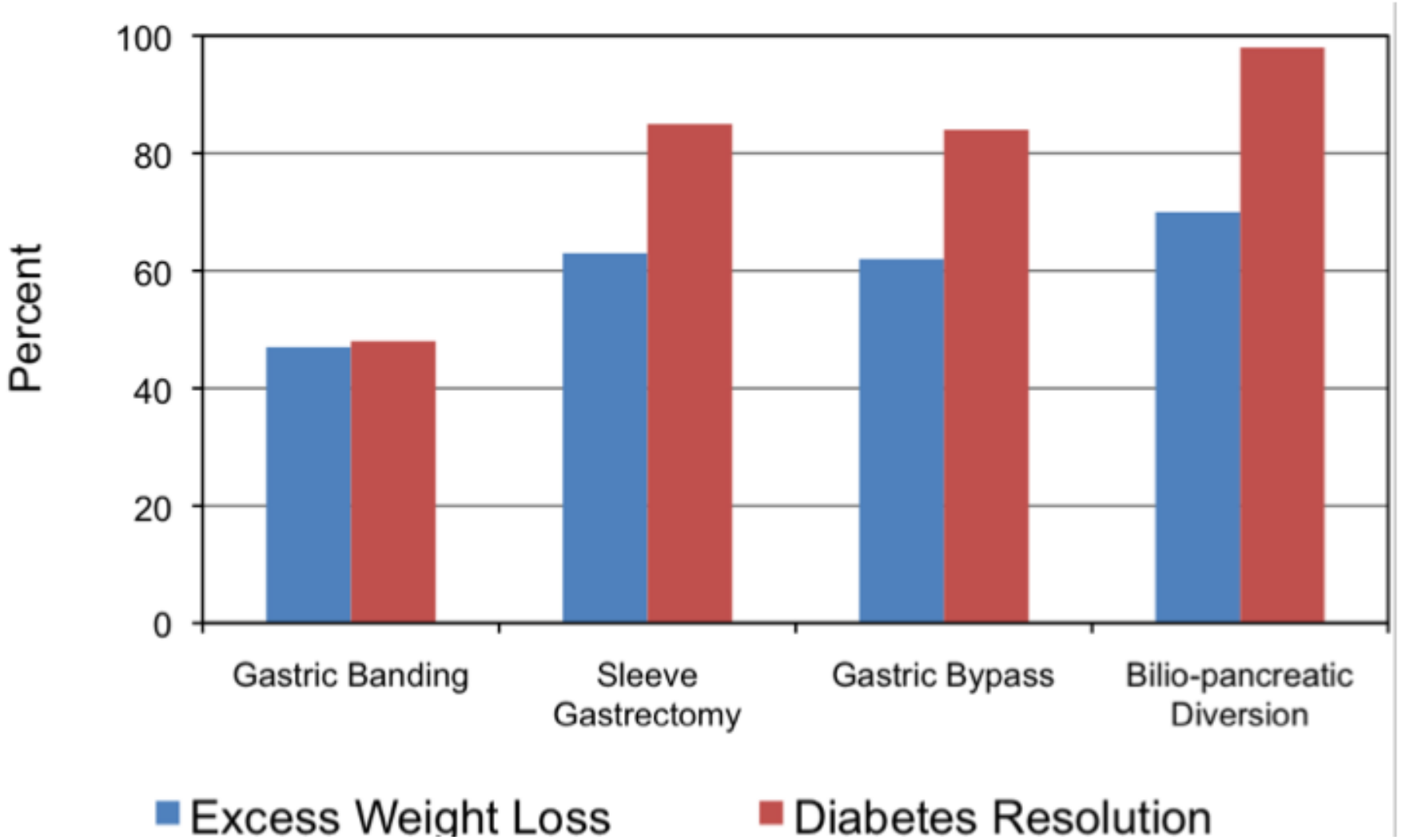
EFFETTI ENDOCRINI CHIRURGIA

	GRELINA	GLP-1	PYY	GIP
Bendaggio gastrico	↑	↔	↔	↔
Sleeve gastrectomy	↓	↑	↑	
RYGBP	variabile	↑	↑	↔
BPD/DS	variabile	↑	↑	↑

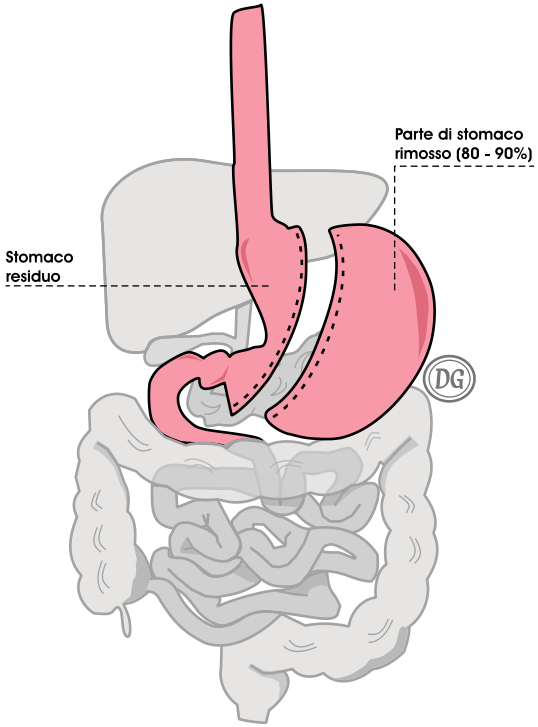
EFFETTI METABOLICI CHIRURGIA

	peso	Resistenza insulina	Secrezione insulinica
Bendaggio gastrico	++	+	-
Sleeve gastrectomy	+++	++	+++
RYGBP	++++	+++	++++
BPD/DS	++++	++++	+++

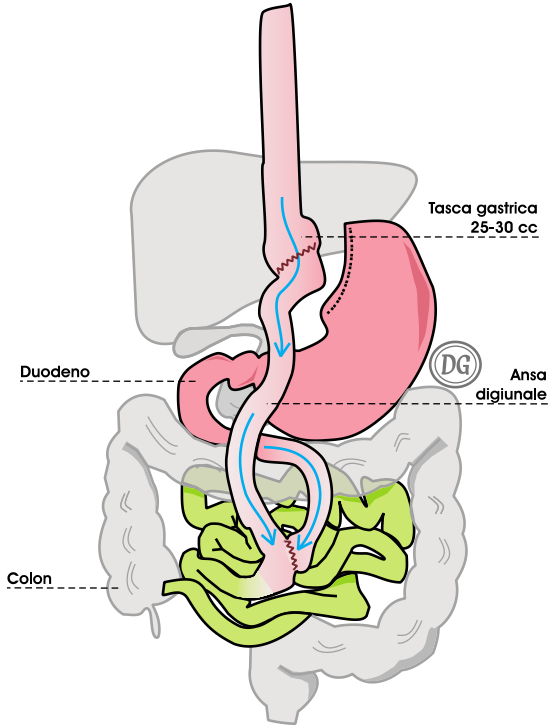
EFFETTI CHIRURGIA SU PESO E DIABETE



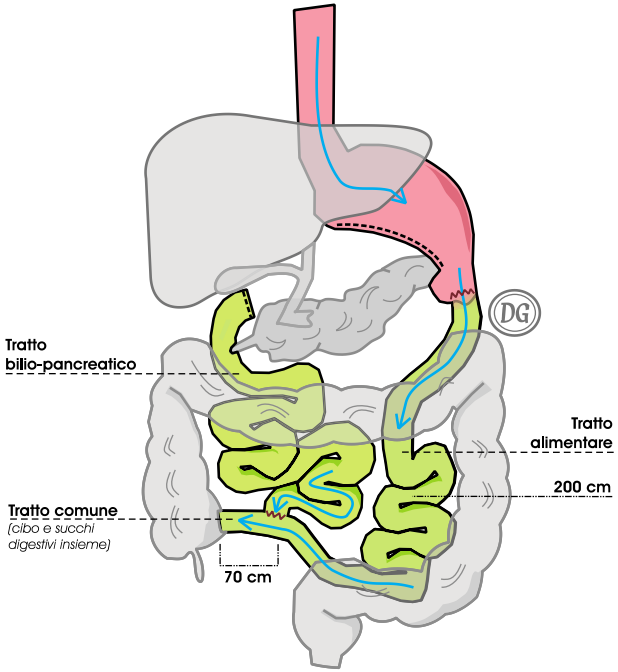
INTERVENTI



Sleeve Gastrectomy



Bypass Gastrico
con ansa alla Roux



Diversione
Bilio-Pancreatica

CHIRURGIA

Interventi diversi con effetti simili, sia nei risultati sia nelle effetti endocrini ad oggi studiati e noti

Come modificare qualcosa di cui so poco, e che soprattutto funziona senza che si sappia perché?

SLEEVE GASTRECTOMY

OBES SURG
DOI 10.1007/s11695-014-1199-9

ORIGINAL CONTRIBUTIONS

Laparoscopic Sleeve Gastrectomy Using 42-French Versus 32-French Bougie: The First-Year Outcome

Hadar Spivak · Moshe Rubin · Eran Sadot · Esther Pollak · Anya Feygin · David Goitein

Conclusions Our data suggest that **using a 42-Fr or 32-Fr bougie does not influence LSG first-year weight loss or resolution of comorbid conditions**. Long-term data is needed to conclude this issue.

BYPASS GASTRICO

Roux-en-Y Gastric Bypass vs Intensive Medical Management for the Control of Type 2 Diabetes, Hypertension, and Hyperlipidemia

The Diabetes Surgery Study Randomized Clinical Trial

Sayeed Ikramuddin, MD
Judith Korner, MD, PhD
Wei-Jei Lee, MD, PhD
John E. Connett, PhD

Importance Controlling glycemia, blood pressure, and cholesterol is important for patients with diabetes. How best to achieve this goal is unknown.

Objective To compare Roux-en-Y gastric bypass with lifestyle and intensive medical management to achieve control of comorbid risk factors.

2240 JAMA, June 5, 2013—Vol 309, No. 21

"The technique was standardized across all sites and was performed with construction of a 20-mL lesser curvature gastric pouch, a 100-cm biliopancreatic limb, and an antecolic 150-cm Roux limb with closure of all mesenteric defects"

BYPASS GASTRICO

OBES SURG (2014) 24:197–204
DOI 10.1007/s11695-013-1081-1

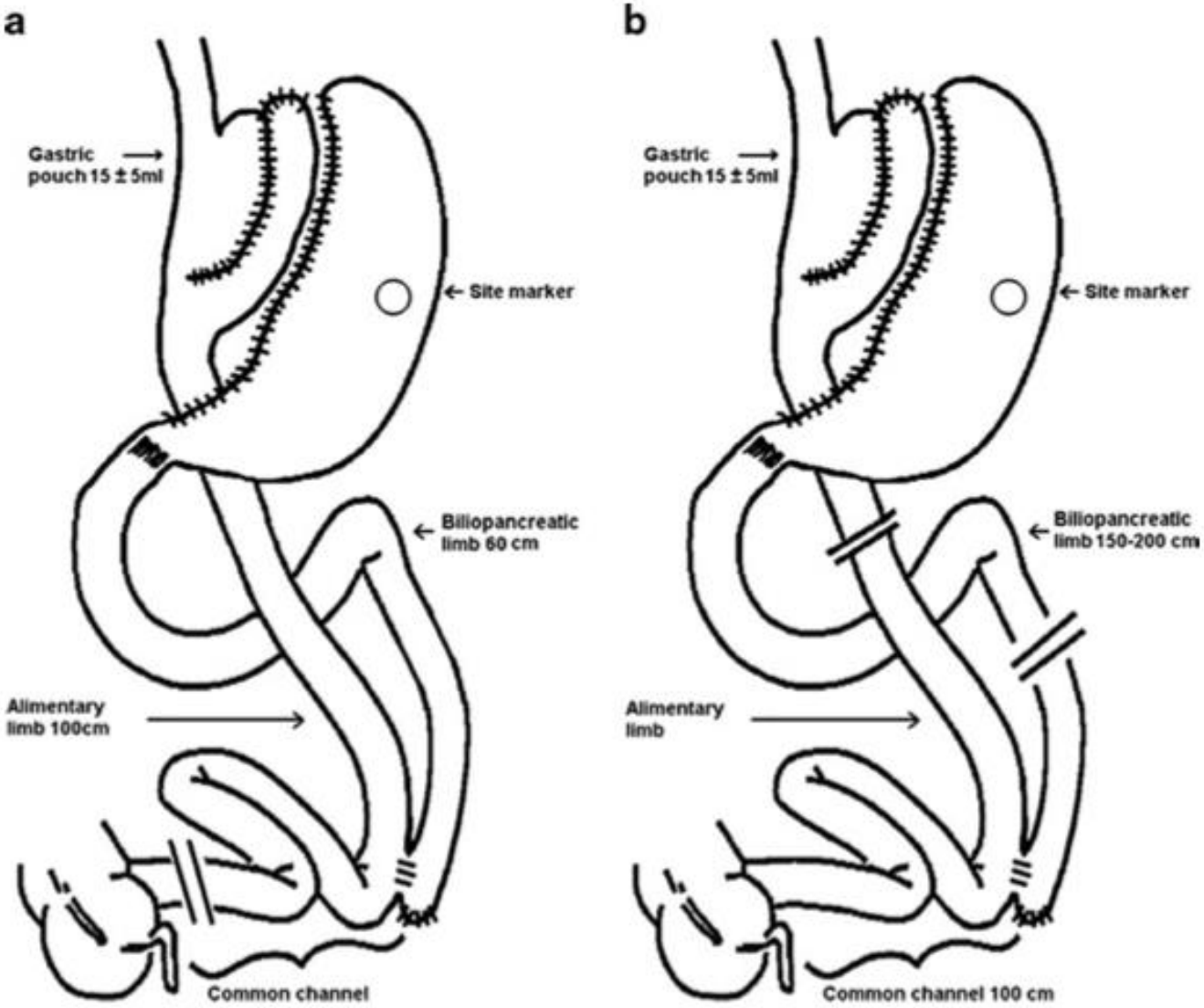
ORIGINAL CONTRIBUTIONS

Long-Term Results of a Prospective Comparison of Roux-en-Y Gastric Bypass versus a Variant of Biliopancreatic Diversion in a Non-Superobese Population (BMI 35–50 kg/m^2)

George Skroubis · Natasa Kouri · Nancy Mead · Fotis Kalfarentzos

BYPASS GASTRICO

Fig. 1 **a** Schematic representation of Roux-en-Y gastric bypass (RYGBP). **b** Schematic representation of biliopancreatic diversion with Roux-en-Y gastric bypass (BPD-RYGBP)



BYPASS GASTRICO

Table 2 Incidence of anemia and related deficiencies (percentage of followed up patients)

	Anemia*			Iron deficiency*			Vitamin B_{12} deficiency*			Low ferritin*			Folate deficiency*		
	RYGBP (%)	BPD-RYGBP (%)	*p*	RYGBP (%)	BPD-RYGBP (%)	*p*	RYGBP (%)	BPD-RYGBP (%)	*p*	RYGBP (%)	BPD-RYGBP (%)	*p*	RYGBP (%)	BPD-RYGBP (%)	*p*
24 months	33.33	40	0.54	20	20	1.00	36.21	42.86	0.54	25.86	14.63	0.22	1.69	2.38	1.00
36 months	26.98	50.79	0.01	28.57	26.98	1.00	30.16	39.68	0.35	30.16	33.33	0.85	0	0	
48 months	39.68	54.10	0.15	23.81	16.39	0.37	22.22	40.98	0.03	33.33	34.43	1.00	0	0	
60 months	40.68	58.18	0.09	32.20	30.91	1.00	20.34	38.18	0.04	42.37	47.27	0.71	3.39	0	0.50
72 months	20.83	54.90	0.0008	31.25	35.29	0.83	8.33	31.37	0.006	33.33	39.22	0.68	0	0	
84 months	38.64	60.97	0.052	31.82	41.46	0.38	18.18	34.15	0.14	29.55	58.54	0.01	0	0	
96 months	39.47	54.05	0.25	31.58	51.43	0.10	15.79	48.65	0.003	39.47	50	0.48	2.63	0	1.00

*Abnormal values: Hb men <13.5 g/dl–women <12.5 g/dl; Fe <50 mg%; B_{12} <200 pg/ml; Ferritin <9 ng/ml; Folate <1.5 ng/ml

BYPASS GASTRICO

Table 3 Bone metabolism derangements (percentage of followed up patients)

	Hypocalcemia*			Hypophosphatemia*			Elevated ALP*			Elevated PTH*		
	RYGBP (%)	BPD-RYGBP (%)	*p*	RYGBP (%)	BPD-RYGBP (%)	*p*	RYGBP (%)	BPD-RYGBP (%)	*p*	RYGBP (%)	BPD-RYGBP (%)	*p*
24 months	0	7.32	0.07	0	2.5	0.42	6.67	37.78	0.0001	0	20	0.02
36 months	0	3.51	0.24	1.69	0	1.00	5.17	35.71	<0.0001	7.94	12.70	0.56
48 months	0	3.51	0.50	1.82	0	0.49	9.09	33.33	0.0024	9.52	11.48	0.78
60 months	0	1.85	1.00	0	3.77	0.50	15.09	33.96	0.04	8.47	10.91	0.76
72 months	2.56	8.33	0.37	0	0		13.51	36.17	0.02	6.25	13.73	0.32
84 months	2.44	0	1.00	0	0		24.39	32.5	0.47	6.82	17.07	0.19
96 months	0	5.88	0.23	0	3.23	0.47	22.22	37.5	0.19	0	11.43	0.05

*Abnormal values: Ca <8.5 mg/dl; Phos <2.5 mg/dl; ALP (alkaline phosphatase) >104 units/lt; PTH (parathormone) >90 ng/lt

DIVERSIONE BILIOPANCREATICA

Dati Prof Nicola Scopinaro, non pubblicati,
da studio in corso “CLAMP STUDY”

10 soggetti BMI 25-30. End points: emoglobina glicata, complicazioni e side effects

BPD modificata: tratto alimentare 300 cm, comune 100 cm

preop: 8.6% (8.0-11.5)

1-2 months: 6.6% (4.8-8.1)

4 months: 6.4% (4.9-8.0)

8 months: 6.0% (4.6-7.6)

12 months: 6.0% (4.0-7.8)

DIVERSIONE BILIOPANCREATICA

Dati Prof Nicola Scopinaro, non pubblicati,
da studio in corso “CLAMP STUDY”

“the side effects are practically absent in this small group of patients with longer intestinal limbs; as to major nutritional complications, their frequency is already so small that a much larger number of operated patients and longer observational time will be needed to verify their actual further reduction”

DIVERSIONE BILIOPANCREATICA

Surgery 1996
SCOPINARO et al.

958 BPD TRATTO ALIMENTARE CM 200

Malnutrizione proteica 12%

Revisioni di BPD per malnutrizione 4%

Obesity Surgery 2007
MARINARI et al

251 BPD TRATTO ALIMENTARE CM 250

Malnutrizione proteica 1.9%

Revisioni di BPD per malnutrizione 1.2%

CONCLUSIONI

1. La diversione biliopancreatica è l'unica procedura di cui esistano modifiche praticate e pubblicate volte alla riduzione degli effetti nutrizionali, ma al tempo stesso la BPD è un intervento poco eseguito
2. Sleeve gastrectomy e bypass gastrico non sono ad oggi state modificate
3. Non conoscendo a fondo i meccanismi di azione degli interventi di chirurgia bariatrica/metabolica è molto difficile ipotizzare una modifica degli stessi