

**Cerrahi sonrası  
erken ve  
geç dönemde  
metabolik takip**

**Prof. Dr. İbrahim Şahin  
İnönü Üniversitesi**

# Bariatrik cerrahinin başarılı olması için

- Kilo vermenin sağlanması
- Yağsız vücut kütlesinin korunması
- Sağlıklı beslenme sağlanması
- Makro ve mikronütrientlerin eksikliğini giderilmesi
- Komorbiditelerin azalması/ iyileşmesi

**Ekip çalışması önemli..!!!**

American Society for Metabolic and Bariatric Surgery position statement on sleeve gastrectomy as a bariatric procedure 2007.

[Bosnic G. Nutritional requirements after bariatric surgery. Crit Care Nurs Clin North Am 2014; 26:255.](#)

# Beslenme programı

Besin	zaman
Az şekerli sıvı gıdalar	İlk 24 saat te başlanıp 4-6/ gün (Taburcu)
Sıvı gıdalardan oluşan diyet	10-14 gün
Püre gıdalar	10-14 gün
Yumuşak gıdalar	14 gün
Normal gıdalar	Genelde 1-1.5 ay

## Hidrasyon..!!!

Summary of Bariatric Surgery Guideline

Turk J Endocrinol Metab 2017;21:140-147

# Makronütrienler/proteinler

## Protein Miktarı:

- Kadınlarda 46 gr/ gün Erkeklerde 56 gr/gün
- *0.8 - 1.2 gram/kg /gün olacak şekilde bireysel ihtiyaçlara göre*
- Total kalorinin en az % 10 (<%35) proteinlerden oluşmalı
- *Aktif kilo verme döneminde 1.2 gr/gün ( Kas kitlesini korumak için)*
- Biliopankreatik diversion ve duodenal switch (BPD/DS)  
1.5 - 2.0 gram protein/kg /gün (malabsorpsiyon daha fazla)

# Makronütrienler / Karbonhidratlar ve yağlar

- Günlük kalori ihtiyacının yaklaşık 50'si karbonhidratlardan oluşmalıdır
- Erken dönemde minimum 50 gr /gün , ancak 130 gr 'a kadar çıkabilir
- Kompleks karbonhidratlar seçilmeli ve hasta bu konuda eğitilmeli
- Basit şekerlerin tüketimi günlük toplam kaloringin %10'unu geçmemeli .

**Yağlar** : Günlük kalori ihtiyacını %20-35'ni oluşturmalı

- ( örneğin 1600-kcal-diyet için 35- 60 gram),
- Unsature yağlar tercih edilmeli.

# Mikronütrientlerin eksiklik nedenleri

- Preoperatif eksiklik  
( Obezite malnütrisyon ve mikronütrient eksikliği için risk faktörü)
- Diyetle alımın azalması
- Malabsorbsiyon
- Yetersiz süplementasyon

# TEMED obezite kılavuzu 2017

Tablo 5.6.1. Bariyatrik cerrahi öncesi ve sonrası izlenmesi gereken klinik ve biyokimyasal parametreler

	Preop	1. ay	3. ay	6. ay	12. ay	18. ay	24. ay	Yıllık
Tam kan	x	x	x	x	x	x	x	x
Karaciğer fonksiyon testleri	x	x	x	x	x	x	x	x
Glukoz	x	x	x	x	x	x	x	x
Kreatinin	x	x	x	x	x	x	x	x
Elektrolitler	x	x	x	x	x	x	x	x
Demir/ferritin	x			xa	xa	xa	xa	xa
B12 vitamini	x			xa	xa	xa	xa	xa
Folat	x			xa	xa	xa	xa	xa
Kalsiyum	x			xa	xa	xa	xa	xa
Parathormon	x			xa	xa	xa	xa	xa
D vitamini	x			xa	xa	xa	xa	xa
Albumin/prealbumin	x			xa	xa	xa	xa	xa
A vitamini	x							Opsiyonel
Çinko	x				Opsiyonel			Opsiyonel
Kemik mineral yopunluğu	x					xa	xa	xa
B1 vitamini								Opsiyonel

a: RYGB, BPD, veya BPD/DS. gibi malabsorbtif işlemlerden sonra yapılması önerilir.

Heber D, Greenway FL, Kaplan LM, et al. Endocrine and nutritional management of the post-bariatric surgery patient: an Endocrine Society Clinical Practice Guideline. J Clin Endocrinol Metab. 2010;95:4823-43.'den uyarlanmıştır.

# Vitaminler ve eser elementler

Tüm bariatrik cerrahileri tiplerinde  
Vitaminler ve eser elementlerin  
24 ay  
verilmesi

Gastrik bypass ve Biliopankreatik  
diversionda ise  
yaşam boyu  
verilmesi öneriliyor

Discrepancies (except for vitamin B1, in bold) among US, Swiss and French Recommended Dietary Allowances (RDAs) in vitamins (Vit.), electrolytes, trace elements, and iron, in the adult general population. US RDAs were stated by Food and Nutrition Board, Institute of Medicine, and National Academies, Swiss RDAs from a conjoint work by German, Austrian and Swiss Nutrition Societies (D-A-CH, Deutschland (Germany)-Austria-Switzerland)), and French RDAs by the National Agency for Food Security, Environment and Work (ANSES). M, men; W, women.

Micronutrient/ electrolyte/ mineral	US RDAs	Swiss RDAs	French RDAs
Vit. A	900 (M)-700 (W) µg = 2997 (M)-2331 (W) UI	1000 µg = 3333 UI	800 µg = 2664 UI
<b>Vit. B1</b>	<b>1.2 mg</b>	<b>1.2 mg</b>	<b>1.2 mg</b>
Vit. B2	1.3 (M)-1.1 (W) mg	1.4 mg	1.5 mg
Vit. B3-PP	16 (M)-14 (W) mg	15 mg	12 mg
Vit. B5	5 mg	6 mg	5 mg
Vit. B6	1.5 mg	1.5 mg	1.8 mg
Vit. B9	400 µg	400 µg	330 µg
Vit. B12	2.4 µg	3 µg	2.4 µg
Vit. C	90 (M)-75 (W) mg	100 mg	110 mg
Vit. D	15 µg = 600 UI	5 µg = 200 UI	5 µg = 200 UI
Vit. E	15 mg	13 mg	12 mg
Vit. K	120 (M)-90 (W) µg	70 µg	45 µg
Calcium	1200 mg	1000 mg	900 mg
Phosphorus	700 mg	700 mg	750 mg
Magnesium	420 (M)-320 (W) mg	350 mg	400 mg
Zinc	11 (M)-8 (W) mg	10 mg	15 mg
Selenium	55 µg	70 µg	70 µg
Iron	8 mg (M-W)	10 (M)-15 mg (W)	10 (M)-15 mg (W)

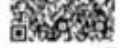
The Swiss Society for the Study of Morbid  
Obesity and Metabolic Disorders (SMOB) 2013



# TEMED obezite kılavuzu 2017

Tablo 5.6.2. Bariyatrik cerrahi sonrası uygulanması gereken vitamin ve minerallerin dozları

Vitamin / mineral desteęi	Doz
Multivitamin preparatı	Günde 1-2 adet
A vitamini	1 mg
E vitamini	100-300 mg
K vitamini	65-80 mcg
C vitamini	500 mg
Demir	45-60 mg
inko	15 mg
Biotin	3000 mcg
Folik asit	400 mcg/gün
Kalsiyum sitrat	1200-2000 mg/gün
D vitamini	400-800 U/gün
Vitamin B12	≥350 mcg/gün oral veya 1000 mcg/gün intramusküler



# Summary of Bariatric Surgery Guideline of the Society of Endocrinology and Metabolism of Turkey

## Türkiye Endokrinoloji ve Metabolizma Derneği Bariatrik Cerrahi Kılavuzu Özeti

Tevfik Sabuncu, Sinem Kıyıcı\*, Mehmet Ali Eren, Seda Sancak\*\*, Alper Sönmez\*\*\*, Sibel Güldiken\*\*\*\*, Faruk Kutlutürk\*\*\*\*\*, İbrahim Şahin\*\*\*\*\*, Murat Yılmaz\*\*\*\*\*, Fahri Bayram\*\*\*\*\*

Harran University Medical Faculty, Department of Endocrinology and Metabolism, Sanliurfa, Turkey

\*University of Health Sciences, Yüksek İhtisas Training and Research Hospital, Department of Endocrinology and Metabolism, Bursa, Turkey

\*\*University of Health Sciences, Fatih Sultan Mehmet Training and Research Hospital, Department of Endocrinology and Metabolism, Istanbul, Turkey

\*\*\*University of Health Sciences, Gülhane Training and Research Hospital, Department of Endocrinology and Metabolism, Ankara, Turkey

\*\*\*\*Trakya University Medical Faculty, Department of Endocrinology and Metabolism, Edirne, Turkey

\*\*\*\*\*Gaziosmanpaşa University Medical Faculty, Department of Endocrinology and Metabolism, Tokat, Turkey

\*\*\*\*\*İnönü University Medical Faculty, Department of Endocrinology and Metabolism, Malatya, Turkey

\*\*\*\*\*Reyap Sağlık Grubu, Department of Endocrinology and Metabolism, Çorlu, Istanbul, Turkey

\*\*\*\*\*Erciyes University Medical Faculty, Department of Endocrinology and Metabolism, Kayseri, Turkey

# TEMD Bariatrik Cerrahi Kılavuzu 2017

**Table 6. Recommended nutritional supplements after bariatric surgery.**

Supplement	Gastric band	SG	RYGB	BPD-DS
Multivitamin plus minerals each containing iron, folic acid and thiamine (number of tablets)	1	2	2	2
Calcium citrate 1200–1500 mg/day or				
Calcium carbonate 2000 mg/day	+	+	+	+
Vitamin D at least 3000 IU titrate to >30 ng/dL	+	+	+	+
Vitamin B12 1000 µg/1–3 month im, 350–1000 µg/day oral	+	+	+	+
Iron 45–60 mg/day via multivitamin	-	+	+	+

GB: Gastric banding; SG: Sleeve gastrectomy; RYGB: Roux-en-Y gastric bypass; BPD/DS: Biliopancreatic diversion with duodenal switch.

## Clinical symptoms of selected vitamin deficiencies

Vitamin	Deficiency syndrome
<b>Water-soluble vitamins</b>	
Vitamin B1 (thiamine)	Beriberi – Congestive heart failure (wet beriberi), aphonia, peripheral neuropathy, Wernicke encephalopathy (nystagmus, ophthalmoplegia, ataxia), confusion, or coma
Vitamin B2 (riboflavin)	Nonspecific symptoms including edema of mucous membranes, angular stomatitis, glossitis, and seborrheic dermatitis (eg, nose, scrotum)
Niacin (nicotinic acid)	Pellagra – Dermatitis on areas exposed to sunlight; diarrhea with vomiting, dysphagia, mouth inflammation (glossitis, angular stomatitis, cheilitis); headache, dementia, peripheral neuropathy, loss of memory, psychosis, delirium, catatonia
Vitamin B6 (pyridoxine, pyridoxal)	Anemia, weakness, insomnia, difficulty walking, nasolabial seborrheic dermatitis, cheilosis, stomatitis
Vitamin B12 (cobalamin)	Megaloblastic anemia (pernicious anemia), peripheral neuropathy with impaired proprioception and slowed mentation
Folate	Megaloblastic anemia
Biotin	Nonspecific symptoms including altered mental status, myalgia, dysesthesias, anorexia, maculosquamous dermatitis
Pantothenate	Nonspecific symptoms including paresthesias, dysesthesias ("burning feet"), anemia, gastrointestinal symptoms
Vitamin C (ascorbate)	Scurvy – fatigue, petechiae, ecchymoses, bleeding gums, depression, dry skin, impaired wound healing
<b>Fat-soluble vitamins</b>	
Vitamin A (retinol, retinal, retinoic acid)	Night blindness, xerophthalmia, keratomalacia, Bitot spot, follicular hyperkeratosis
Vitamin D (cholecalciferol, ergocalciferol)	Rickets, osteomalacia, craniotabes, rachitic rosary
Vitamin E (tocopherols)	Sensory and motor neuropathy, ataxia, retinal degeneration, hemolytic anemia
Vitamin K (phylloquinone, menaquinone, menadione)	Hemorrhagic disease

# **Diyabet / glukoz takibi**

# Erken dönem

- Diyabetik hastalar hiperglisemi ve hipoglisemi açısından yakından izlenmelidir.
- Postoperatif dönemde hipoglisemiyi önlemek için,  
*Sekretagog türü oral antidiyabetiklerin kesilmesi insülin dozlarının azaltılması uygun olur.*
- Her vizitte glisemik kontrol değerlendirilmeli, tedavi gerekiyorsa revize edilmelidir
- A1C takibi yapılmalıdır

# Glisemik kontroldeki düzelme farklı mı?

- RYGB: günler- haftalar içinde başlar, *(kilo kaybından bağımsız)*
- Sleeve Gastrektomi: Değişken
- Gastrik band: Geç dönemde başlıyor

[Rubino F. Diabetes Care 2008; 31 Suppl 2:S290.](#)

[Rhee NA. Diabetes Obes Metab 2012; 14:291.](#)

[Osto E, Circulation 2015; 131:871.](#)

**Diyabet remisyonunu öngörebilir miyiz?**



# (ABCD) score.

- Age,
- Body mass index,
- C-peptide level,
- Duration of T2D

Calculation of ABCD score for the probability of diabetes remission after metabolic surgery

Variable	Points on ABCD index gastric bypass <i>P</i> value			
	0	1	2	3
Age	≥40	<40		
BMI, kg/m <sup>2</sup>	<27	27–34.9	35–41.9	>42
C-peptide, ng/L	<2	2–2.9	3–4.9	>5
Duration of diabetes, yr	>8	4–8	1–3.9	<1

Comparison of 5-year T2D remission rate of SG and GB at different ABCD score

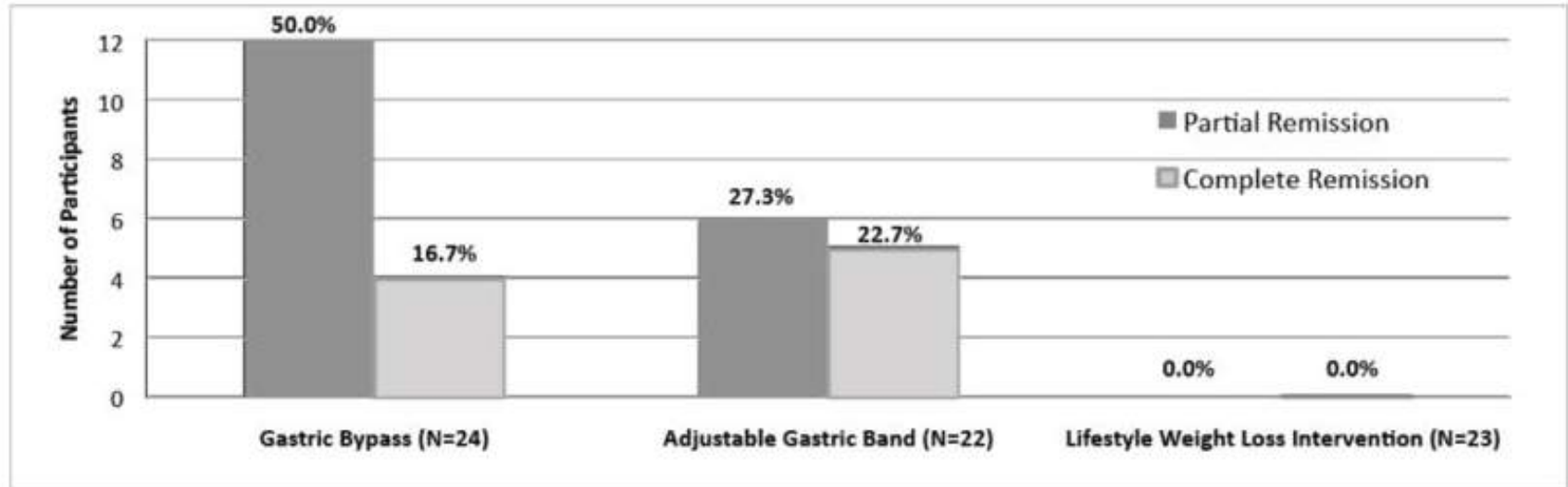
SCORE	SG		GB		<i>P</i> value
	N	Remission N (%)	N	Remission N (%)	
10–9	7	6 (86)	51	50 (98)	.229
8–7	21	17 (81)	64	59 (92)	.215
6–5	15	10 (67)	50	42 (84)	.036*
4–3	10	4 (40)	61	31 (51)	.735
2–0	3	0 (0)	28	5 (18)	.012*
Total	56	37 (66)	254	187 (74)	.253

T2D = type 2 diabetes; SG = sleeve gastrectomy; GB = gastric bypass procedures; ABCD score = age, body mass index, C-peptide level, and duration of type 2 diabetes score.

\**P* < .05.

# Farklı yöntemlerle DM remisiyon oranları

## T2DM Remission at Month 12



Partial Remission of T2DM = no medications for diabetes, glycated hemoglobin <6.5% and FPG  $\leq$  125 mg/dL.

Complete Remission of T2DM = no medications for diabetes, glycated hemoglobin <5.7% and FPG  $\leq$  100 mg/dL.



# Bariatric Surgery versus Intensive Medical Therapy in Obese Patients with Diabetes

Philip R. Schauer, M.D., Sangeeta R. Kashyap, M.D., Kathy Wolski, M.P.H., Stacy A. Brethauer, M.D., John P. Kirwan, Ph.D., Claire E. Pothier, M.P.H., Susan Thomas, R.N., Beth Abood, R.N., Steven E. Nissen, M.D., and Deepak L. Bhatt, M.D., M.P.H.

**Table 1. Characteristics of the Patients at Baseline.\***

Characteristic	Medical Therapy (N = 50)	Gastric Bypass (N = 50)	Sleeve Gastrectomy (N = 50)	P Value
Duration of diabetes — yr	8.9±5.8	8.2±5.5	8.5±4.8	0.72
Use of insulin — no. (%)	22 (44)	22 (44)	22 (44)	1.00
Age — yr	49.7±7.4	48.3±8.4	47.9±8.0	0.46
Female sex — no. (%)	31 (62)	29 (58)	39 (78)	0.08
Body-mass index†				
Value	36.8±3.0	37.0±3.3	36.2±3.9	0.42
<35 — no. (%)	19 (38)	14 (28)	18 (36)	0.54
Body weight — kg	106.5±14.7	106.7±14.8	100.8±16.4	0.10
Waist circumference — cm	114.5±9.4	116.4±9.2	114.0±10.4	0.43
Waist-to-hip ratio	0.95±0.09	0.96±0.07	0.96±0.09	0.88
White race — no. (%)‡	37 (74)	37 (74)	36 (72)	0.97
Smoker — no./total no. (%)	15/42 (36)	20/50 (40)	11/50 (22)	0.14
Metabolic syndrome — no. (%)	46 (92)	45 (90)	47 (94)	1.00
History of dyslipidemia — no./total no. (%)	36/43 (84)	44/50 (88)	40/50 (80)	0.55
History of hypertension — no./total no. (%)	26/43 (60)	35/50 (70)	30/50 (60)	0.51

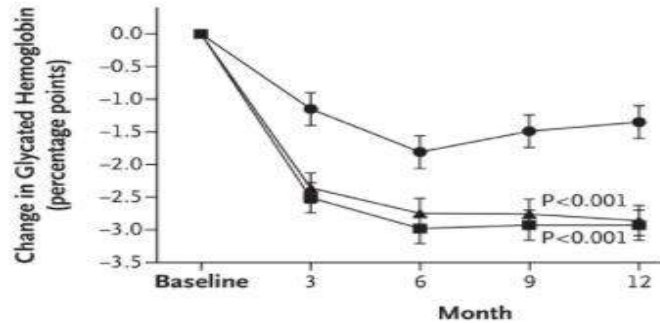


# Bariatric Surgery versus Intensive Medical Therapy in Obese Patients with Diabetes

Philip R. Schauer, M.D., Sangeeta R. Kashyap, M.D., Kathy Wolski, M.P.H., Stacy A. Brethauer, M.D., John P. Kirwan, Ph.D., Claire E. Pothier, M.P.H., Susan Thomas, R.N., Beth Abood, R.N., Steven E. Nissen, M.D., and Deepak L. Bhatt, M.D., M.P.H.

● Intensive medical therapy ■ Roux-en-Y gastric bypass ▲ Sleeve gastrectomy

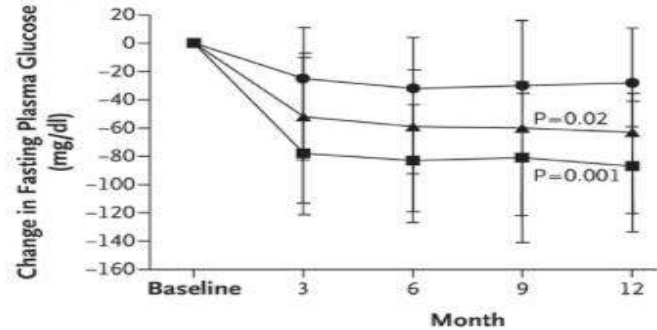
**A Change in Glycated Hemoglobin**



**Value at Visit**

Intensive medical therapy	8.9	7.7	7.1	7.4	7.5
Roux-en-Y gastric bypass	9.3	6.8	6.3	6.4	6.4
Sleeve gastrectomy	9.5	7.1	6.7	6.7	6.6

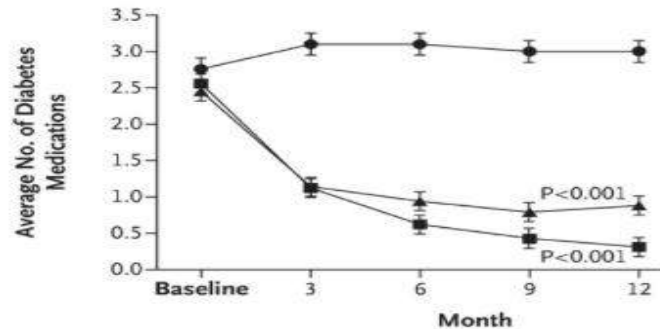
**B Change in Fasting Plasma Glucose**



**Value at Visit**

Intensive medical therapy	155	122	113	120	120
Roux-en-Y gastric bypass	193	109	96	96	99
Sleeve gastrectomy	164	118	104	102	97

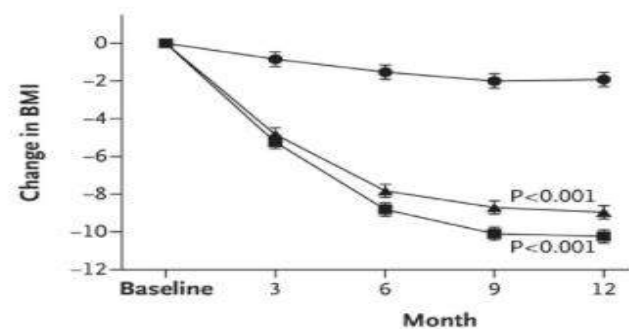
**C Average No. of Diabetes Medications**



**Value at Visit**

Intensive medical therapy	2.8	3.1	3.1	3.0	3.0
Roux-en-Y gastric bypass	2.6	1.1	0.6	0.4	0.3
Sleeve gastrectomy	2.4	1.1	0.9	0.8	0.9

**D Change in BMI**



**Value at Visit**

Intensive medical therapy	36.3	35.4	34.8	34.5	34.4
Roux-en-Y gastric bypass	37.0	31.8	28.2	26.9	26.8
Sleeve gastrectomy	36.1	31.3	28.3	27.3	27.2

## **Lifestyle Intervention and Medical Management With vs Without Roux-en-Y Gastric Bypass and Control of Hemoglobin A1c, LDL Cholesterol, and Systolic Blood Pressure at 5 Years in the Diabetes Surgery Study.**

Ikramuddin S<sup>1</sup>, Korner J<sup>2</sup>, Lee WJ<sup>3</sup>, Thomas AJ<sup>4,5</sup>, Connett JE<sup>4</sup>, Bantle JP<sup>6</sup>, Leslie DB<sup>1</sup>, Wang Q<sup>4</sup>, Inabnet WB 3rd<sup>7</sup>, Jeffery RW<sup>8</sup>, Chong K<sup>9</sup>, Chuang LM<sup>10</sup>, Jensen MD<sup>11</sup>, Vella A<sup>11</sup>, Ahmed L<sup>12</sup>, Belani K<sup>13</sup>, Billington CJ<sup>6,14</sup>.

1. yılda . A1c düzeyi <%7

% 83 bariatrik cerrahi, %29 cerrahi olmayan grup

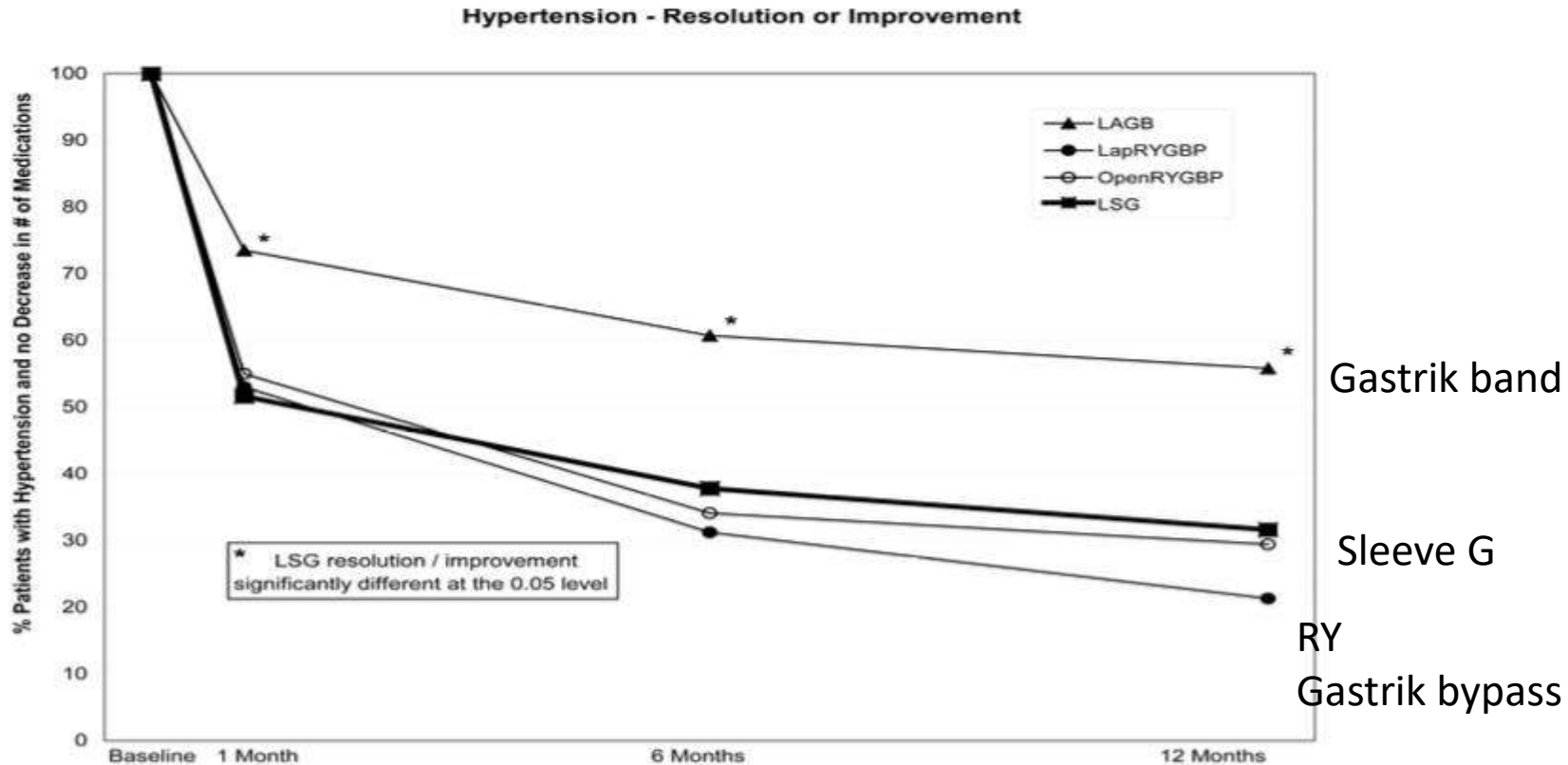
5. yılda . A1c düzeyi <%7

% 55 bariatrik cerrahi, %14 cerrahi olmayan grup

## **Kan basıncı takibi**

Kan basıncı her vizitte ölçülmeli  
Tedavi gözden geçirilmelidir

# Kan basıncındaki değişim



	Baseline	1 month	6 months	12 months
LSG "N" for Analysis	525	407	151	38
% Available for follow-up with Data	100%	81%	79%	81%
LAGB "N" for Analysis	5,641	4,799	3,286	1,405
% Available for follow-up with Data	100%	88%	83%	78%
LapRYGBP "N" for Analysis	7,880	7,029	4,644	2,054
% Available for follow-up with Data	100%	90%	83%	76%
OpenRYGBP "N" for Analysis	583	455	330	143
% Available for follow-up with Data	100%	78%	74%	65%

## Reduction in obesity-related comorbidities: is gastric bypass better than sleeve gastrectomy?

Gastrik bypass ile Sleeve Gastrektomi arasında **Hipertansiyonun düzelmesi** açısından fark var mı?

558 hasta prospektif değerlendiriliyor ( hipertansiyonda düzelme)

	<b>Gastrik bypass</b>		<b>Sleeve Gastrektomi</b>
30. Gün	%23.5 ' e	karşın	%22.5
6.Ay	%40 'a	karşın	% 39.2
1. Yıl	%59.9 'a	karşın	% 38.



**Kilo takibi**

# Kilo kaybı

	Fazla kilonun kaybı (%)	Süre(yıl)
R.Y.G Bypass	60-85	1-1.5
S.Gastrektomi	55-80	1-15
A.Gastrik Band	45-55	2

1. Buchwald H, Avidor Y, Braunwald E, et al. Bariatric surgery: a systematic review and meta-analysis. JAMA 2004; 292:1724.

2. Ballantyne GH. Measuring outcomes following bariatric surgery: weight loss parameters, improvement in co-morbid conditions, change in quality of life and patient satisfaction. Obes Surg 2003; 13:954.

# Kilo kaybı – zaman ilişkisi

- ilk 6 ay  
4.5 - 7 kg / ay

- 6 ay-1 yıl  
2-3 kilo/ay

6. ayda kilo kaybı  
27 - 36 kg

- 1. yıl kilo kaybı  
45 - 54 kg

**Original Investigation**

January 16, 2018

**Swiss study**

# **Effect of Laparoscopic Sleeve Gastrectomy vs Laparoscopic Roux-en-Y Gastric Bypass on Weight Loss in Patients With Morbid Obesity**

## **The SM-BOSS Randomized Clinical Trial**

Ralph Peterli, MD<sup>1</sup>; Bettina Karin Wölnerhanssen, MD<sup>2,3</sup>; Thomas Peters, MD<sup>4</sup>; [et al](#)

**217 morbid obez: 1, 2 ve 5 yıllık takip verileri benzer**

**5.yıl takip verileri**

**Gastrik bypass %68.3**

**Sleeve Gastrektomi %61.1**

**Original Investigation**

January 16, 2018

## **Finnish Study**

# **Effect of Laparoscopic Sleeve Gastrectomy vs Laparoscopic Roux-en-Y Gastric Bypass on Weight Loss at 5 Years Among Patients With Morbid Obesity**

The SLEEVEPASS Randomized Clinical Trial

**240 morbid obez 5 yıllık takip verileri**

**Gastrik bypass %57**

**Sleeve Gastrektomi % 49**

# 10-Year Outcomes After Roux-en-Y Gastric Bypass

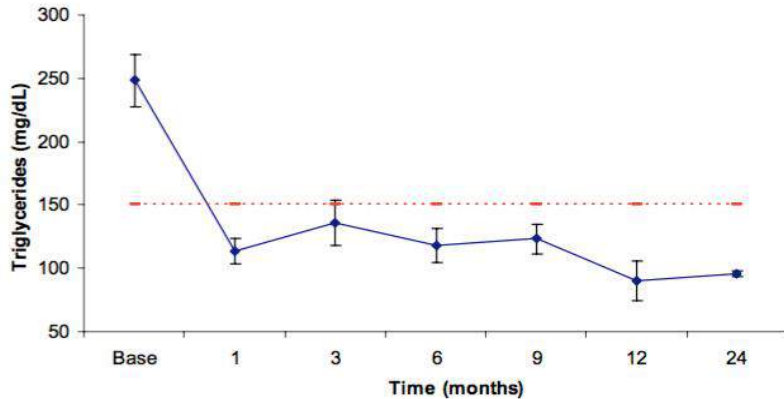
J. Hunter Mehaffey; Damien J. LaPar; Kathleen C. Clement; Florence E. Turrentine; Michael S. Miller; Peter T. Hallowell; Bruce D. Schirmer

- 651 RYGB' li hastanın 10 yıl takip edildiği bir çalışmada fazla kilonun
- 2 . yılda % 74 kayıp
- **10. yılda % 52 kayıp**

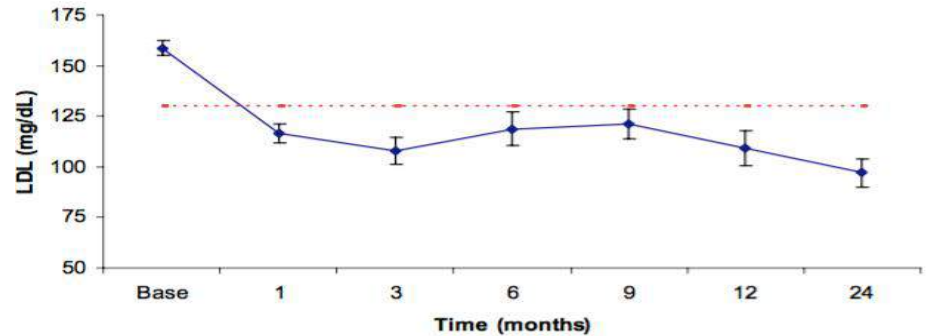
# Lipid profili

# Resolution of Hyperlipidemia after Laparoscopic Roux-en-Y Gastric Bypass

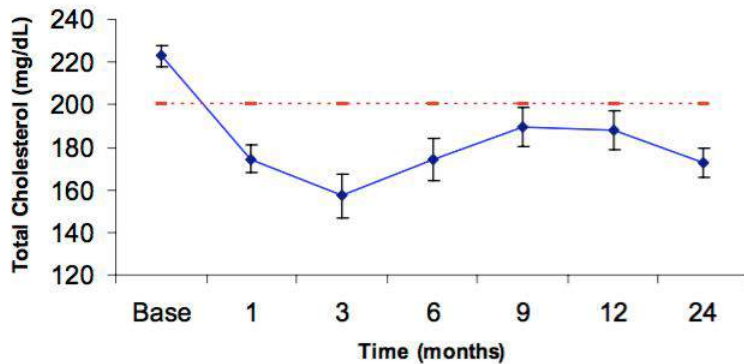
Ninh T Nguyen, MD, FACS, Esteban Varela, MD, Allen Sabio, BS, Cam-Ly Tran, MD, Michael Stamos, MD, Samuel E Wilson, MD, FACS



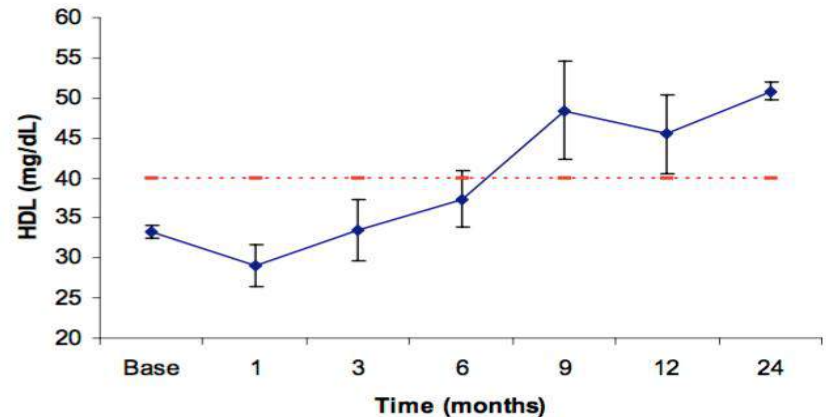
**Figure 1.** Changes in triglyceride levels after laparoscopic gastric bypass. Base represents baseline, dotted line represents maximal desirable level according to the National Cholesterol Education



**Figure 4.** Changes in low-density lipoprotein (LDL) cholesterol levels after laparoscopic gastric bypass. Base represents baseline, dotted line represents maximal desirable level according to the National Cholesterol Education Program.<sup>6</sup>



**Figure 2.** Changes in total cholesterol levels after laparoscopic gastric bypass. Base represents baseline, dotted line represents maximal desirable level according to the National Cholesterol Education Program.<sup>6</sup>



**Figure 3.** Changes in high-density lipoprotein (HDL) cholesterol levels after laparoscopic gastric bypass. Base represents baseline, dotted line represents minimal desirable level according to the National Cholesterol Education Program.<sup>6</sup>





# Teşekkürler

*[ibrahim.sahin@inonu.edu.tr](mailto:ibrahim.sahin@inonu.edu.tr)*

# Resolution of Hyperlipidemia after Laparoscopic Roux-en-Y Gastric Bypass

Presented at the 1<sup>st</sup> Annual Academic Surgical Congress, San Diego, CA, February 2006.

[Ninh T. Nguyen, MD, FACS](#), [Esteban Varela, MD](#), [Allen Sabio, BS](#), [Cam-Ly Tran, MD](#), [Michael Stamos, MD](#), [Samuel E. Wilson, MD, FACS](#)

Department of Surgery, University of California Irvine Medical Center, Orange, CA.

- In a retrospective study that included 95 patients one year following RYGB, the mean total cholesterol levels decreased by 16 percent, triglyceride levels decreased by 63 percent, low-density lipoprotein cholesterol levels decreased by 31 percent, very-low-density lipoprotein cholesterol decreased by 74 percent, total cholesterol/high-density lipoprotein cholesterol risk ratio decreased by 60 percent, and high-density lipoprotein cholesterol levels increased by 39 percent. In addition, 23 of 28 (82 percent) patients requiring lipid-lowering medications preoperatively no longer required medical therapy [[49](#)].

## Macro-, trace-, and ultra-trace minerals in man

Macro-minerals	Trace minerals	Ultra-trace minerals
Calcium	Copper	Arsenic
Chloride	Iron	Boron
Magnesium	Fluoride	Chromium
Phosphate	Manganese	Iodine
Potassium	Zinc	Molybdenum
Sodium		Nickel
		Selenium
		Silicon
		Vanadium

## Clinical symptoms of selected vitamin deficiencies

Vitamin	Deficiency syndrome
<b>Water-soluble vitamins</b>	
Vitamin B1 (thiamine)	Beriberi – Congestive heart failure (wet beriberi), aphonia, peripheral neuropathy, Wernicke encephalopathy (nystagmus, ophthalmoplegia, ataxia), confusion, or coma
Vitamin B2 (riboflavin)	Nonspecific symptoms including edema of mucous membranes, angular stomatitis, glossitis, and seborrheic dermatitis (eg, nose, scrotum)
Niacin (nicotinic acid)	Pellagra – Dermatitis on areas exposed to sunlight; diarrhea with vomiting, dysphagia, mouth inflammation (glossitis, angular stomatitis, cheilitis); headache, dementia, peripheral neuropathy, loss of memory, psychosis, delirium, catatonia
Vitamin B6 (pyridoxine, pyridoxal)	Anemia, weakness, insomnia, difficulty walking, nasolabial seborrheic dermatitis, cheilosis, stomatitis
Vitamin B12 (cobalamin)	Megaloblastic anemia (pernicious anemia), peripheral neuropathy with impaired proprioception and slowed mentation
Folate	Megaloblastic anemia
Biotin	Nonspecific symptoms including altered mental status, myalgia, dysesthesias, anorexia, maculosquamous dermatitis
Pantothenate	Nonspecific symptoms including paresthesias, dysesthesias ("burning feet"), anemia, gastrointestinal symptoms
Vitamin C (ascorbate)	Scurvy – fatigue, petechiae, ecchymoses, bleeding gums, depression, dry skin, impaired wound healing
<b>Fat-soluble vitamins</b>	
Vitamin A (retinol, retinal, retinoic acid)	Night blindness, xerophthalmia, keratomalacia, Bitot spot, follicular hyperkeratosis
Vitamin D (cholecalciferol, ergocalciferol)	Rickets, osteomalacia, craniotabes, rachitic rosary
Vitamin E (tocopherols)	Sensory and motor neuropathy, ataxia, retinal degeneration, hemolytic anemia
Vitamin K (phylloquinone, menaquinone, menadione)	Hemorrhagic disease



# Bariatric Surgery versus Intensive Medical Therapy in Obese Patients with Diabetes

Philip R. Schauer, M.D., Sangeeta R. Kashyap, M.D., Kathy Wolski, M.P.H., Stacy A. Brethauer, M.D., John P. Kirwan, Ph.D., Claire E. Pothier, M.P.H., Susan Thomas, R.N., Beth Abood, R.N., Steven E. Nissen, M.D., and Deepak L. Bhatt, M.D., M.P.H.

**Table 2. Primary and Secondary End Points at 12 Months.\***

End Point	Medical Therapy (N=41)	Gastric Bypass (N=50)	Sleeve Gastrectomy (N=49)	P Value		
				Gastric Bypass vs. Medical Therapy	Sleeve Gastrectomy vs. Medical Therapy	Gastric Bypass vs. Sleeve Gastrectomy
Glycated hemoglobin						
≤6% — no. (%)	5 (12)	21 (42)	18 (37)	0.002	0.008	0.59
≤6% with no diabetes medications — no. (%)	0	21 (42)	13 (27)	<0.001	<0.001	0.10
Baseline — %	8.9±1.4	9.3±1.4	9.5±1.7			
Month 12 — %	7.5±1.8	6.4±0.9	6.6±1.0	<0.001	0.003	0.23
Change from baseline — percentage points	-1.4±1.5	-2.9±1.6	-2.9±1.8	<0.001	<0.001	0.85