Metabolic and Bariatric Surgery in Class 1 Obesity in Asian Population

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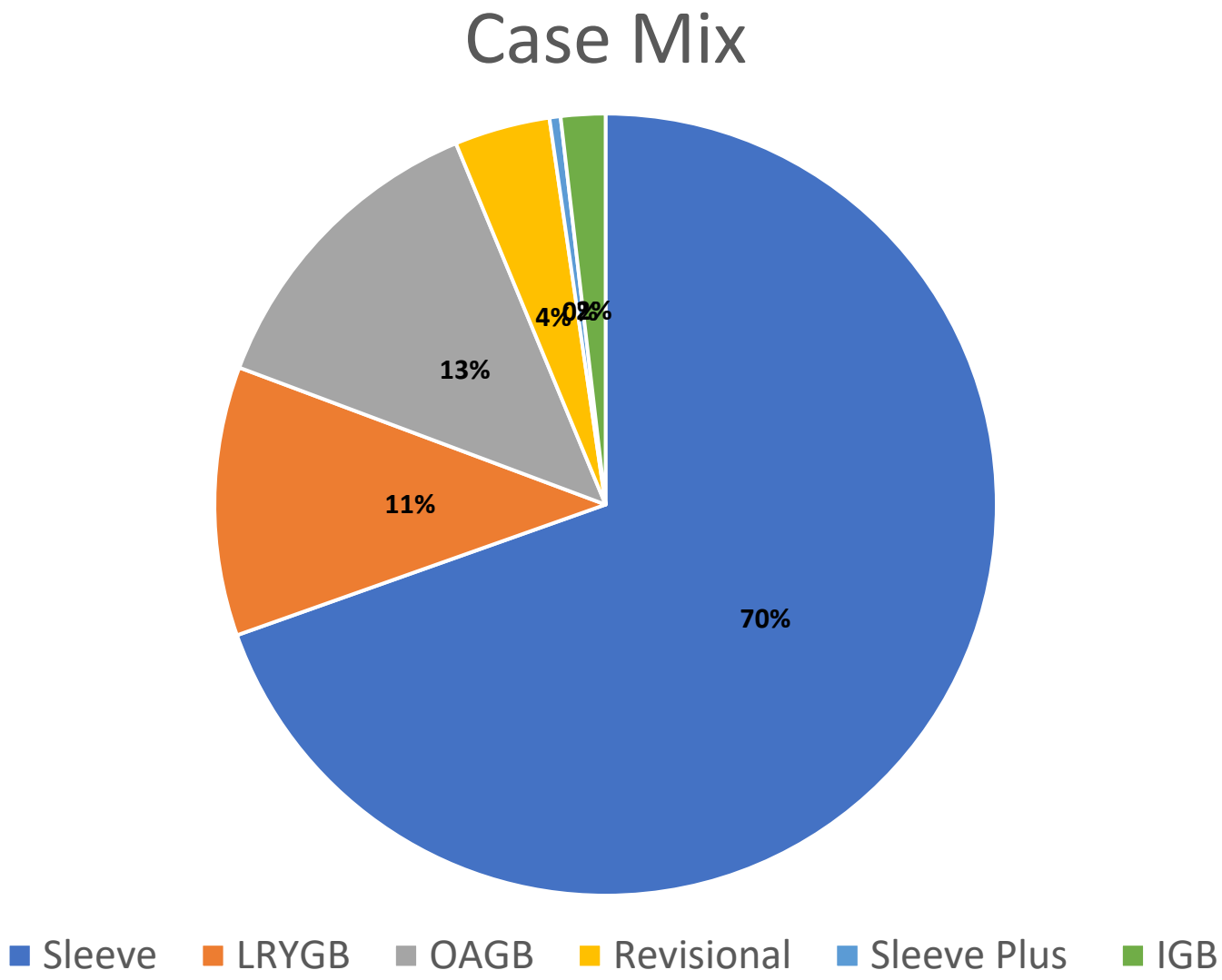
IFSO
NAPOLI
2023



No conflict of interest

Obesity Surgery (2023) 33:3–14
https://doi.org/10.1007/s11695-022-06332-1

ORIGINAL CONTRIBUTIONS

2022 American Society of Metabolic and Bariatric Surgery (ASMBS) and International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) Indications for Metabolic and Bariatric Surgery

Dan Eisenberg[1] · Scott A. Shikora[2] · Edo Aarts[3] · Ali Aminian[4] · Luigi Angrisani[5] · Ricardo V. Cohen[6] · Maurizio de Luca[7] · Silvia L. Faria[8] · Kasey P.S. Goodpaster[4] · Ashraf Haddad[9] · Jacques M. Himpens[10] · Lilian Kow[11] · Marina Kurian[12] · Ken Loi[13] · Kamal Mahawar[14] · Abdelrahman Nimeri[15] · Mary O'Kane[16] · Pavlos K. Papasavas[17] · Jaime Ponce[18] · Janey S. A. Pratt[1,19] · Ann M. Rogers[20] · Kimberley E. Steele[21] · Michel Suter[22,23] · Shanu N. Kothari[24]

- **Major updates to 1991 National Institutes of Health guidelines for bariatric surgery**
- MBS is recommended for individuals with a BMI >35 kg/m$_2$, regardless of presence, absence, or severity of co-morbidities.
- MBS should be considered for individuals with metabolic disease and BMI of 30-34.9 kg/m$_2$
- **BMI thresholds should be adjusted in Asian population such that a BMI >25 kg/m$_2$ suggests clinical obesity**
- **Asian individuals with BMI >27.5 kg/m$_2$ should be offered MBS**
- Long-term results of MBS consistently demonstrate safety and efficacy.
- Appropriately selected children and adolescents should be considered for MBS

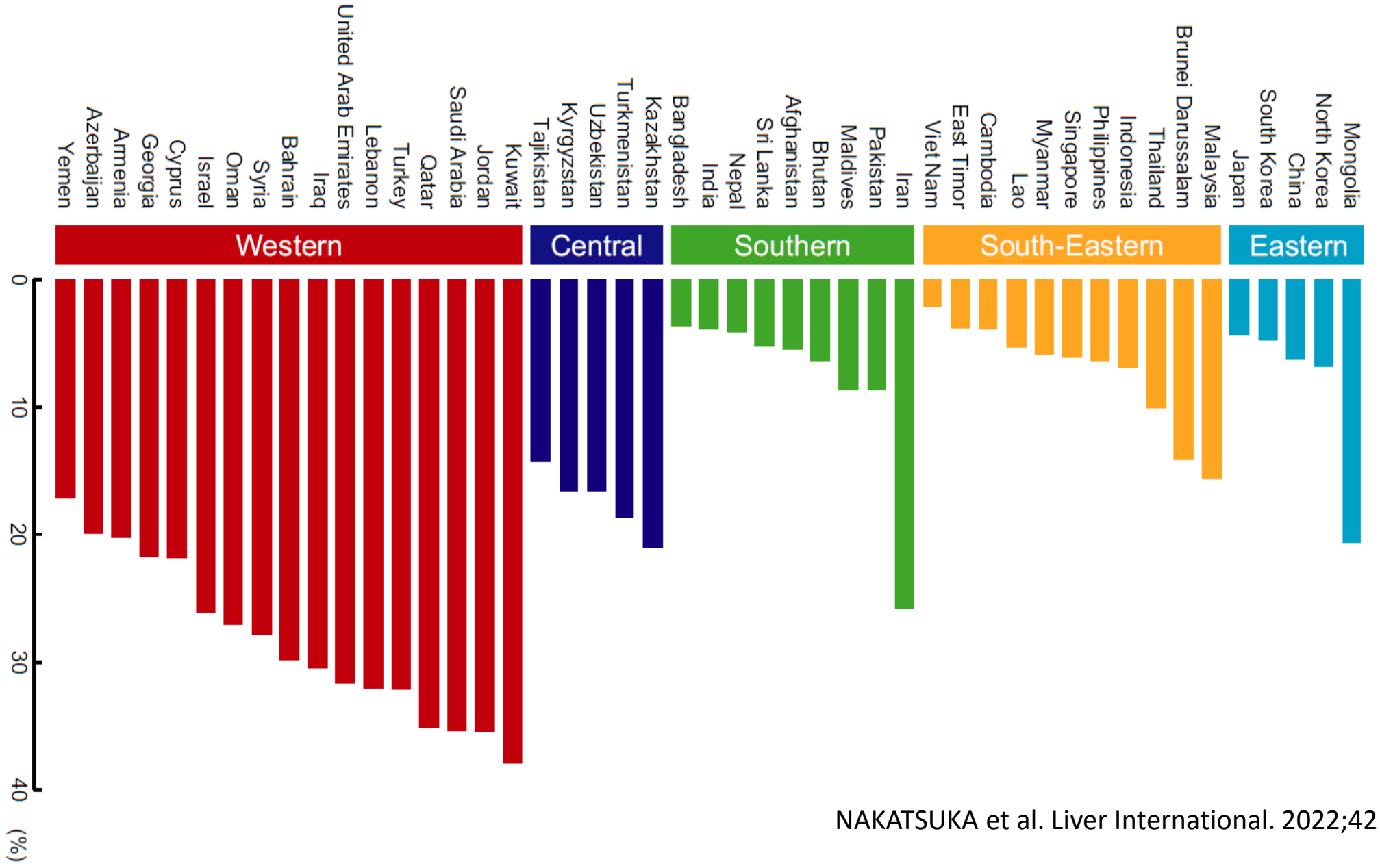
Countries or regions	Indication of bariatric surgery (BMI)		Indication of metabolic surgery (BMI)	
	2010	2020	2010	2020
Japan	≥ 35	≥ 35	≥ 32 with a comorbidity	≥ 32 with T2DM or other 2 comorbidities
Korea	≥ 40	≥ 35	≥ 35 with a comorbidity	≥ 30 with a comorbidity or ≥ 27.5 with T2DM
China	≥ 40 or ≥ 35 with comorbidities	≥ 32.5	None	≥ 27.5 with T2DM
Taiwan	≥ 40 or ≥ 35 with comorbidities	≥ 37.5 or ≥ 32.5 with T2DM or other 2 comorbidities	None	≥ 27.5 with poorly controlled T2DM
Hong Kong	≥ 37.5 or ≥ 32.5 with comorbidities	≥ 35 or ≥ 30 with comorbidities	None	≥ 27.5 with poorly controlled T2DM
Philippines	≥ 35 with comorbidities	≥ 35	None	≥ 32 with T2DM or other 2 comorbidities
Malaysia	≥ 40	≥ 37.5	≥ 35 with T2DM or other 2 comorbidities	≥ 32 with T2DM or other 2 comorbidities
Singapore	≥ 37.5	≥ 37.5	≥ 32.5 with a comorbidity	≥ 32.5 with a comorbidity
Indonesia	> 37	≥ 35	> 32 with comorbidities	> 30 with a comorbidity
Thailand	≥ 37.5	≥ 37.5	≥ 32.5 with a comorbidity	≥ 32.5 with T2DM or other 2 comorbidities
India	≥ 40	≥ 35	≥ 35 with comorbidities	≥ 30 with T2DM or other 2 comorbidities
Sri Lanka	≥ 40	≥ 35	None	None
Australia	≥ 40 or ≥ 35 with comorbidities	≥ 40 or ≥ 35 with comorbidities	None	≥ 30 with T2DM or ≥ 32.5 with Asian

Masayuki Ohta et al. Obesity Surgery (2022) 32:2994–3004

NIH – WHO Consensus

Classification	WHO BMI	Asian BMI
Underweight	< 18.5	< 18.5
Normal Range	18.5 – 24.9	18.5 – 22.9
Overweight	25 – 29.9	23 – 27.4
Obese I	30 – 34.9	27.5 – 32.4
Obese II	35 – 39.9	32.5 – 37.4
Obese III	≥ 40	≥ 37.5

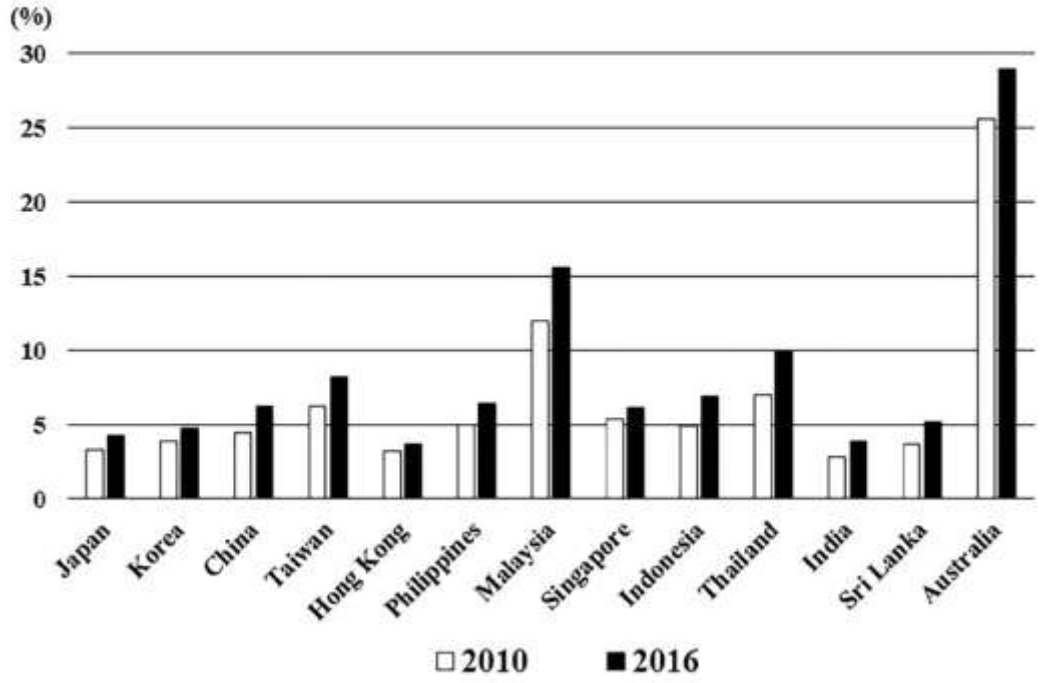
Prevalence of Obesity >30kg/m2 among Asians



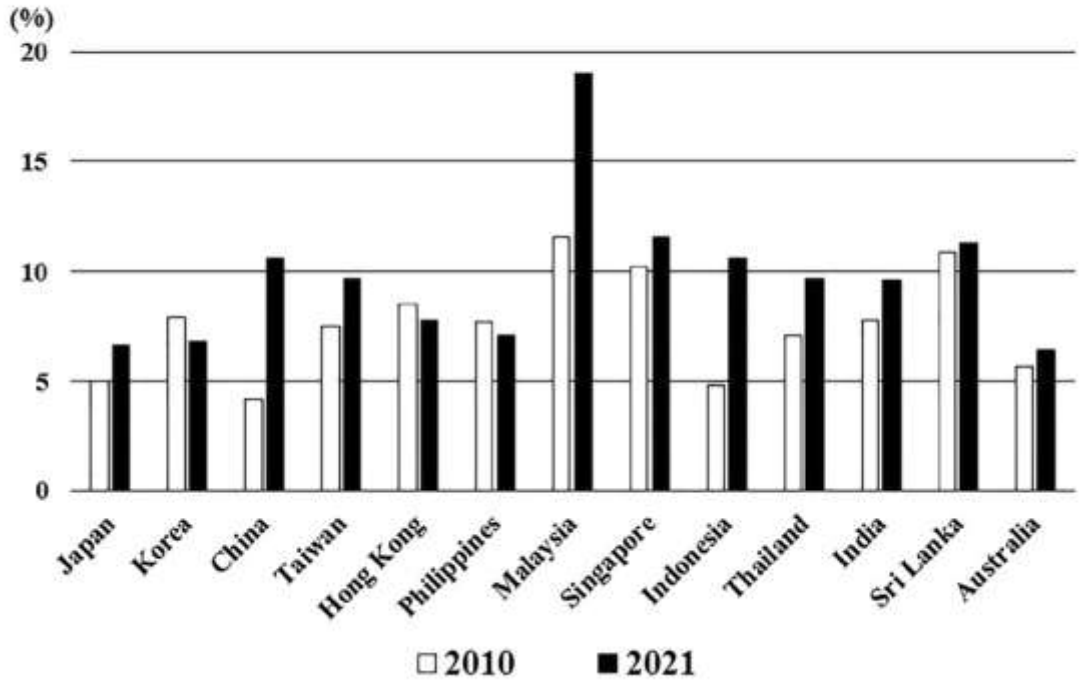
NAKATSUKA et al. Liver International. 2022;42:1955–1968

Prevalence of Obesity & T2DM in Asia

Change sin Prevalence of Obesity > 30kg/m2



Changes in Prevalence of T2DM

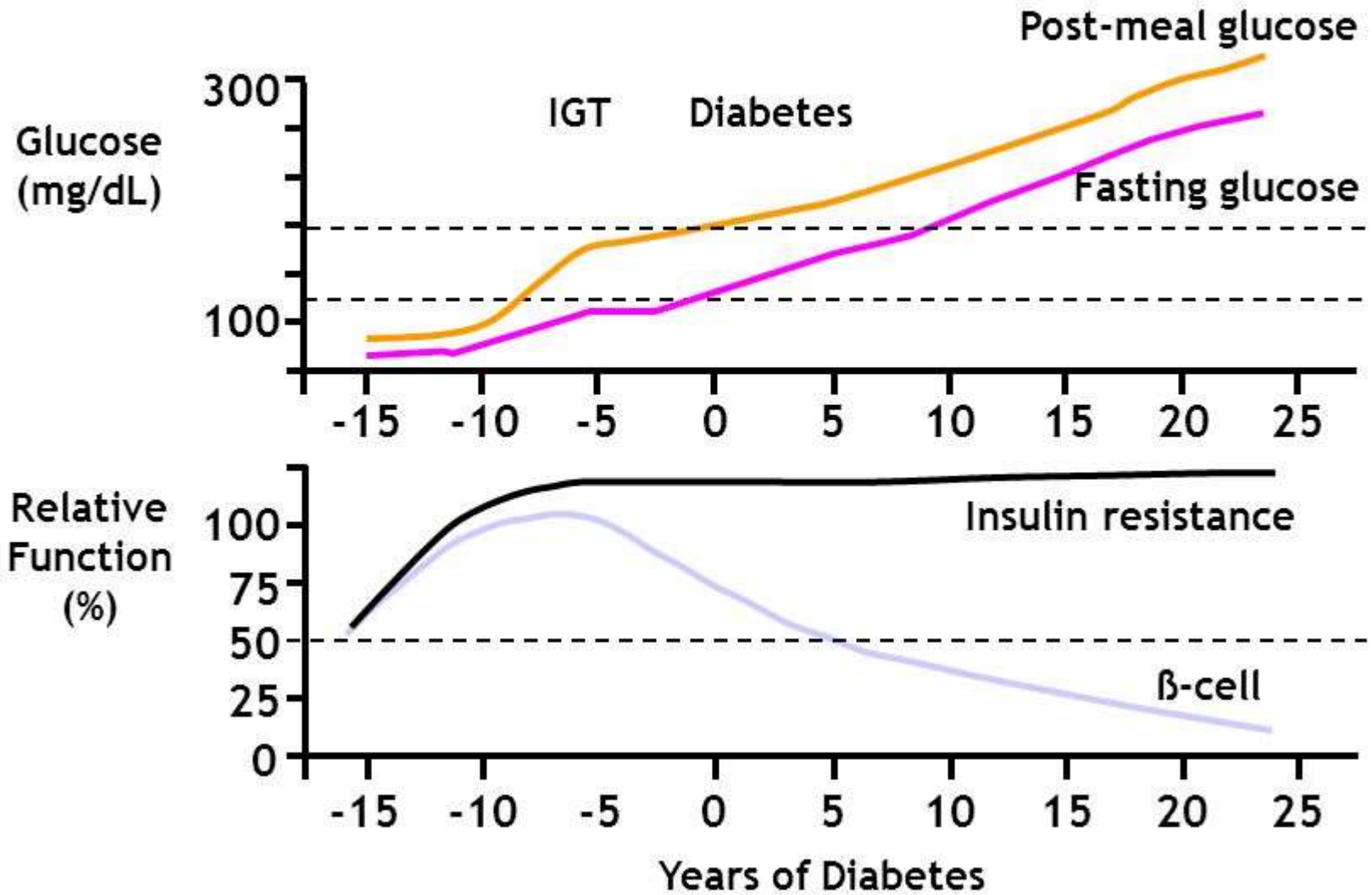


Masayuki Ohta et al. Obesity Surgery (2022) 32:2994–3004

Fact Check – Asians

- Higher %age of body fat for given BMI compared to Westerners
- Asian BMI cutoffs for metabolic risk are lower
- Asian have younger Onset of T2DM
- YOD
  - Poorer controlled T2DM
  - Associated with early Morbidity and Mortality

Natural History of Type 2 Diabetes



Adapted from: International Diabetes Center (Minneapolis, Minnesota).

Endocrine Journal

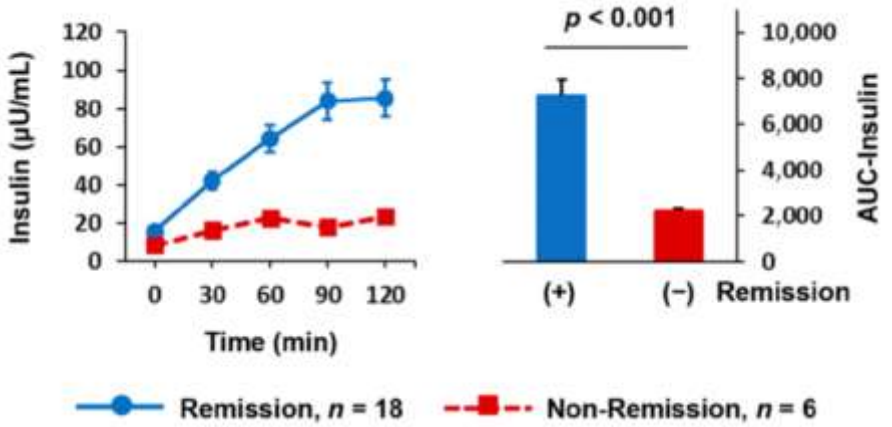
ORIGINAL

Advance Publication
doi:10.1507/endocrj.EJ19-0054

Preserving β-cell function is the major determinant of diabetes remission following laparoscopic sleeve gastrectomy in Japanese obese diabetic patients

Satoshi Ugi[1], Katsutaro Morino[1], Tsuyoshi Yamaguchi[2], Hiroshi Yamamoto[3], Sachiko Kaida[2], Itsuko Miyazawa[1], Daisuke Sato[1], Osamu Sekine[4], Yukihiro Fujita[1], Atsunori Kashiwagi[4], Masaji Tani[2] and Hiroshi Maegawa[1]

	Remission	Non-Remission	*p*-value
n	18	6	
Female (%)	10 (56)	5 (83)	0.351
Age (years)	45.0 ± 11.2	50.5 ± 11.3	0.310
Body Weight (kg)	113.6 ± 18.9	94.7 ± 13.3	0.019
BMI (kg/m^2)	41.4 ± 4.2	41.7 ± 7.0	0.900
Duration (years)	6.4 ± 5.2	17.3 ± 4.2	<0.001
HbA1c (%)	7.8 ± 1.5	9.9 ± 1.6	0.012
Fasting CPR (ng/mL)	3.0 ± 1.0	1.0 ± 0.5	<0.001
Urinary CPR (μg/day)	68.5 ± 43.8	41.2 ± 20.8	0.160
HOMA-IR	4.1 ± 2.4	2.6 ± 1.3	0.191
Insulinogenic Index	0.42 ± 0.25	0.08 ± 0.06	<0.001
SUIT Index	137.6 ± 106.4	38.0 ± 13.6	0.001
ABCD score	5.2 ± 1.5	2.5 ± 0.5	<0.001
IMS score, *n* mild/moderate/severe	3/13/2	0/0/6	<0.001
Insulin user, *n* (%)	4 (22)	6 (100)	0.002



Preserved insulin secretion is the major determinant of diabetes remission

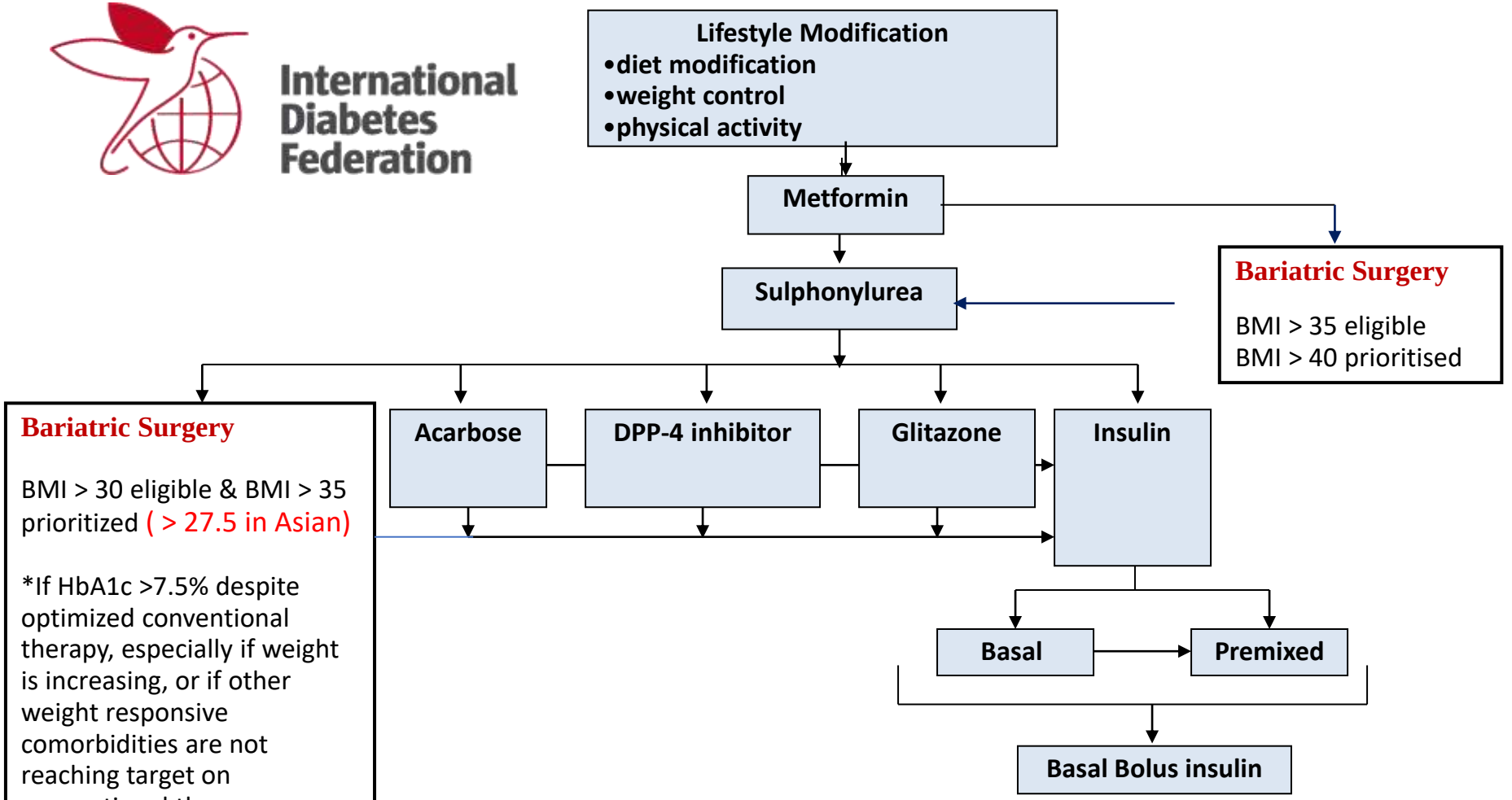
Asian Indications

- A BMI of > 35 kg/m2
- BMI > 32 kg/ m2 with co-morbidities
- BMI > 30 kg/m2 with 2 or more of: raised triglycerides, abdominal obesity (waist 80 cm in females and 90 cm in males), reduced HDL cholesterol, hypertension, & raised fasting plasma glucose levels

Lakdawala M et al. Asian consensus meeting on metabolic surgery. population. Obes Surg 2010; 20: 929-36

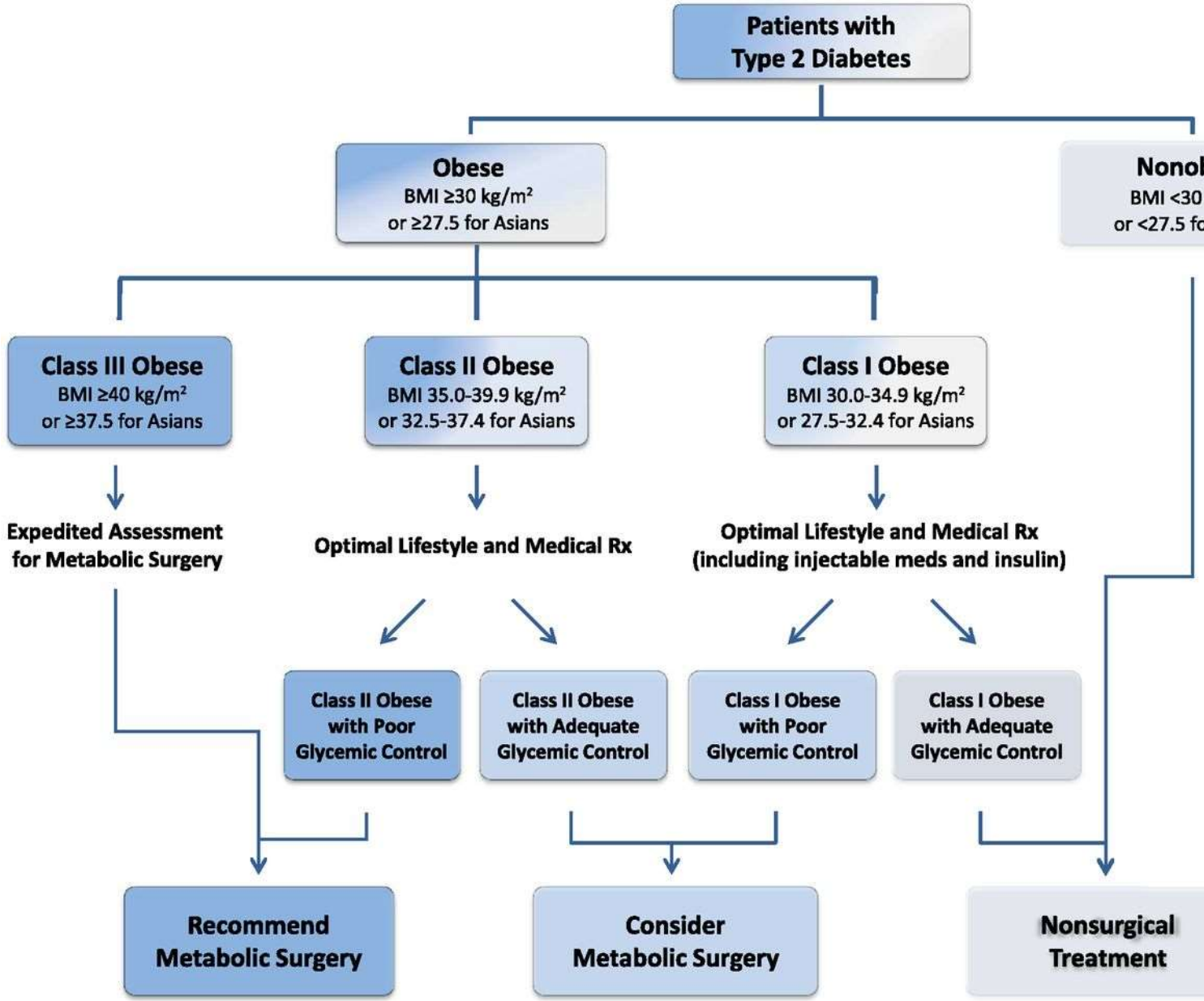
Management Algorithm for Metabolic Control in Type 2 Diabetes

International Diabetes Federation



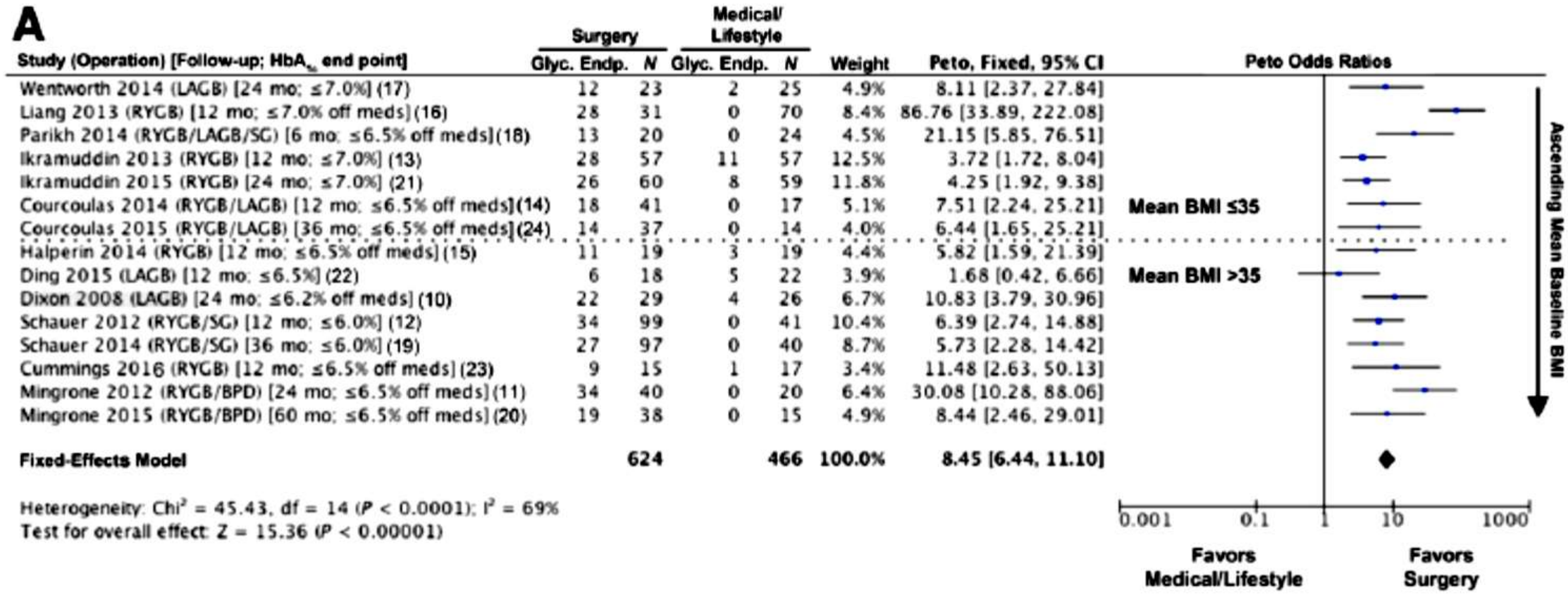
Bariatric Surgical and Procedural Interventions in the Treatment of Obese Patients with Type 2 Diabetes

J B Dixon et al. Diabet Med 2011 Jun;28(6): 628 - 642



Diabetes Care June 2016

HbA1c - BMI



Rubino et al. Diabetes Care June 2016

Laparoscopic sleeve gastrectomy for diabetes treatment in nonmorbidly obese patients: Efficacy and change of insulin secretion

Wei-Jei Lee, MD, PhD,[a] Kong-Han Ser, MD,[a] Keong Chong, MD,[b] Yi-Chih Lee, PhD,[a,d] Shu-Chun Chen, RN,[c] Ju-Juin Tsou, RN,[c] Jung-Chien Chen, MD,[a] *and* Chih-Ming Chen, MD,[b] *Taoyuan City and Jung-Li, Taiwan*

Lee WJ Surgery 2010;147:664-9

OBES SURG (2014) 24:1552–1562
DOI 10.1007/s11695-014-1344-5

NEW CONCEPT

Laparoscopic Sleeve Gastrectomy Versus Single Anastomosis (Mini-) Gastric Bypass for the Treatment of Type 2 Diabetes Mellitus: 5-Year Results of a Randomized Trial and Study of Incretin Effect

Wei-Jei Lee · Keong Chong · Yu-Hung Lin · Jih-Hua Wei · Shu-Chun Chen

ELSEVIER

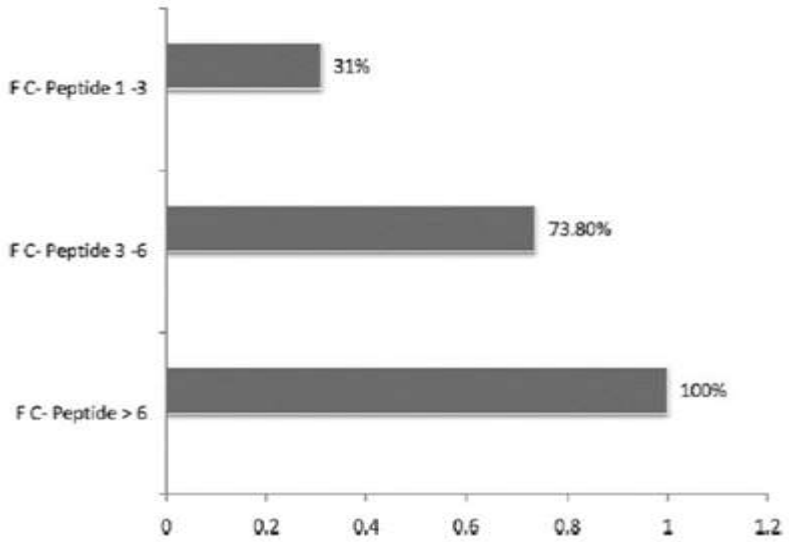
Surgery for Obesity and Related Diseases 9 (2013) 370–378

Original article

Roux-en-Y gastric bypass stands the test of time: 5-year results in low body mass index (30–35 kg/m^2) Indian patients with type 2 diabetes mellitus

Muffazal Lakdawala, M.S.[a,b,c], Shehla Shaikh, M.D., D.M. (Endocrinology)[a,b,d], Saifee Bandukwala, M.D.[a,b,c], Carlyne Remedios, M.Diet., A.P.D.[a], Miloni Shah, R.D.[a], Aparna Govil Bhasker, M.S.[a,b,*]

%EWL	Complete Remission	Partial Remission	No Remission	Number of patients	p-value
Less than 25%	0	0	0	0	
25 to 50%	0	75	25	8	0.00253
50 to 75%	61.76	38.24	0	34	< 0.0001
More than 75%	90	10	0	10	< 0.0001



Original Investigation

Effect of Bariatric Surgery vs Medical Treatment on Type 2 Diabetes in Patients With Body Mass Index Lower Than 35
Five-Year Outcomes

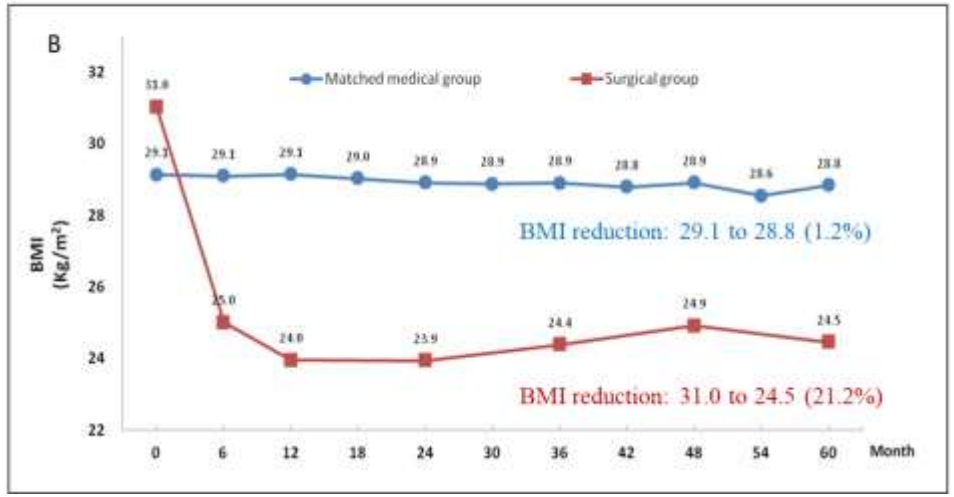
Chih-Cheng Hsu, MD; Abdullah Almulaifi, MD; Jung-Chien Chen, MD; Kong-Han Ser, MD; Shu-Chun Chen, RN; Kai-Ci Hsu, MS; Yi-Chih Lee, MHA; Wei-Jei Lee, MD

Table 1. Differences in Anthropometrics, Metabolic Profiles, Use of Antidiabetic Drugs, and Outcomes Between Baseline and 5-Year Follow-up in the Surgical Group and the Medical Group

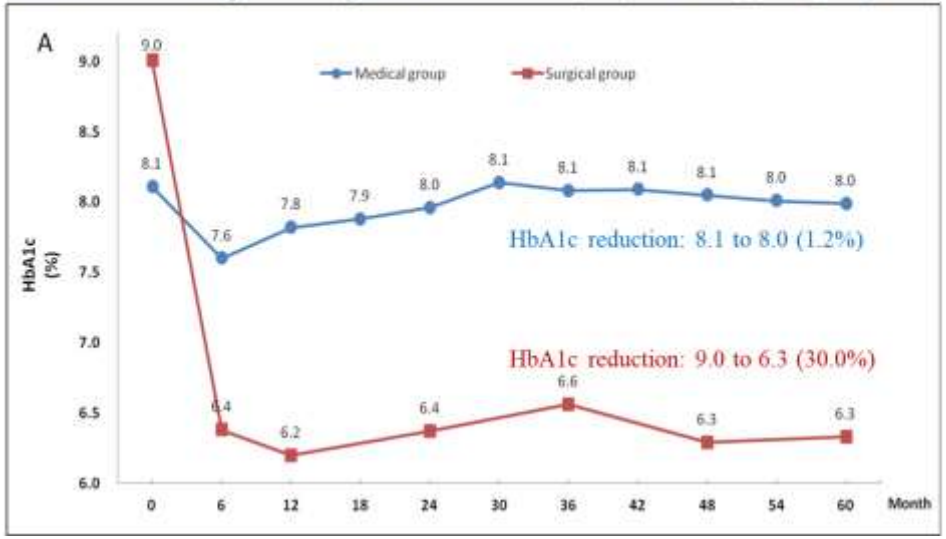
Measure	Surgical Group				Medical Group				
	Baseline (n = 52)	5 y (n = 50)	Difference[a]	*P* Value	Baseline (n = 299)	5 y (n = 250)	Difference[a]	*P* Value	*P* Value[b]
Outcomes, No. (%)									
Remission[e]									
Complete	0	18 (36.0)	36.0	<.001	0	3 (1.2)	1.2	.08	<.001
Partial	0	14 (28.0)	28.0	<.001	2 (0.7)	4 (1.6)	0.9	.31	<.001
Mortality	...	1 (1.9)	...	...	...	9 (3.0)	...	...	.66
ESRD[f]	...	1 (1.9)	...	...	...	2 (0.7)	...	...	.37

JAMA Surg. doi:10.1001/jamasurg.2015.2602
Published online September 16, 2015.

BMI change in 5 years Medical group vs. Surgical group



HbA1c change in 5 years Medical group vs. Surgical group



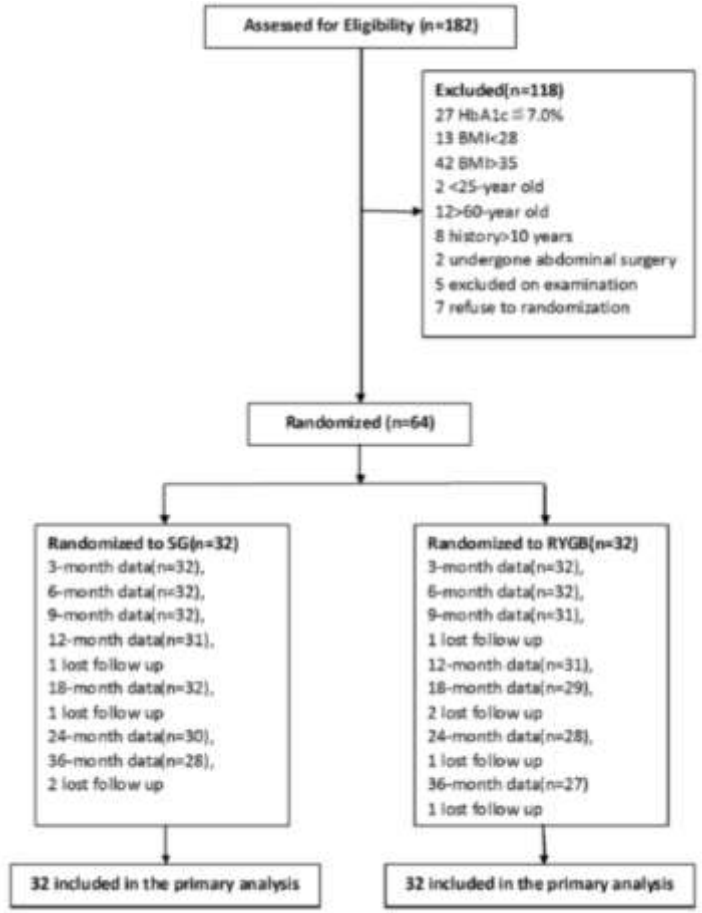
Asian Metabolic Surgery

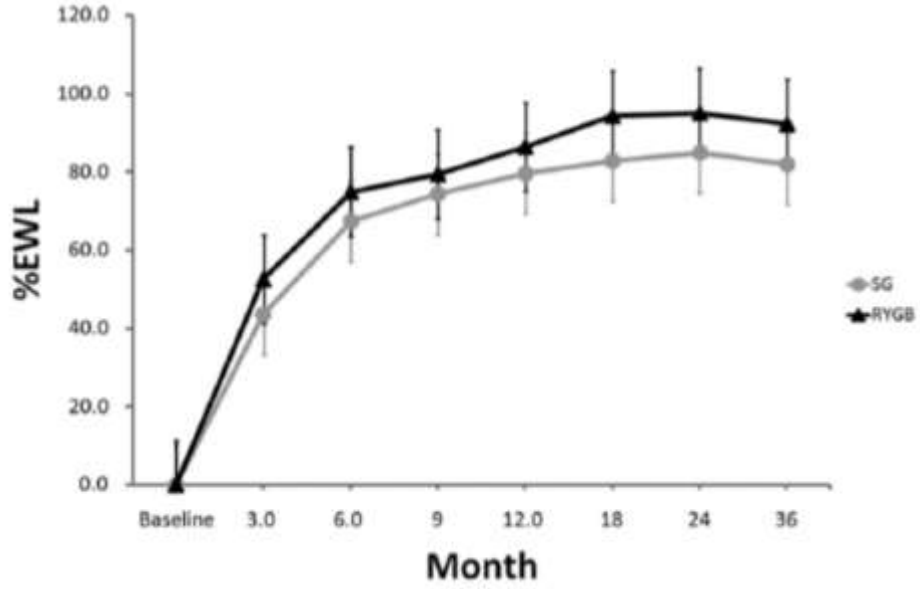
- Jan 1994 – November 2017
- Evidence
  - 26 studies are level I, 59 are level II
  - LSG most commonly reported surgical procedure (63.1%) in Asia
- **16 studies which showed that laparoscopic metabolic surgery is an effective and safe treatment for T2DM in patients with a BMI of > 25 kg/m2 to < 35 kg/m2 in Asia**

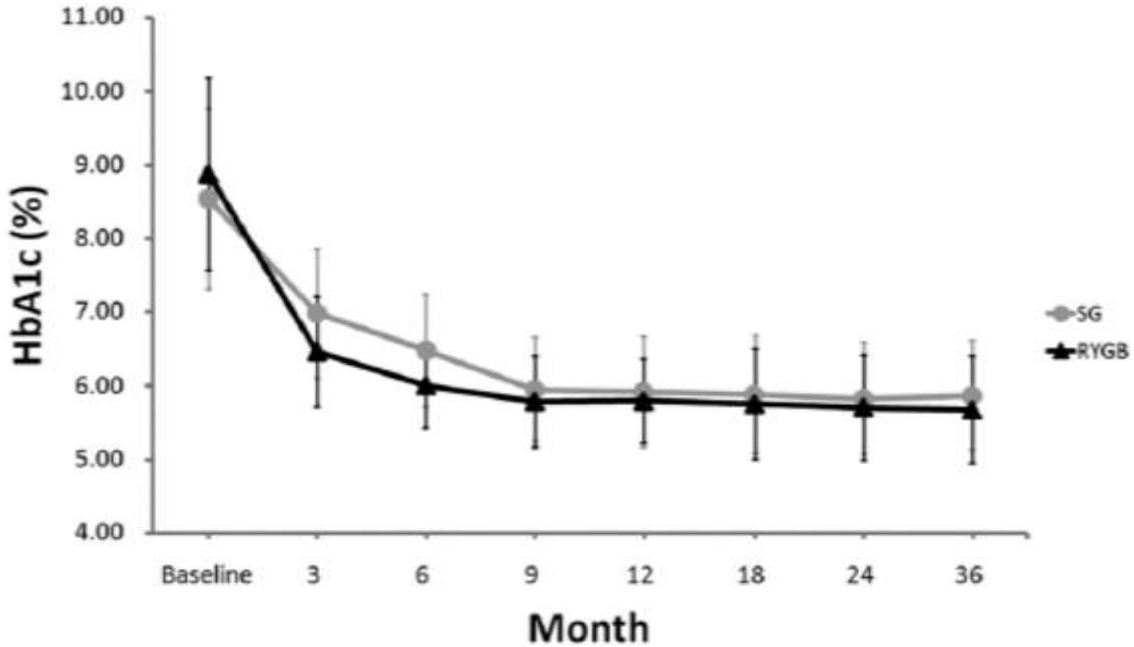
Dong et al. BMC 2018

Long-term effects of laparoscopic sleeve gastrectomy versus roux-en-Y gastric bypass for the treatment of Chinese type 2 diabetes mellitus patients with body mass index 28-35 kg/m^2

Jingge Yang, Cunchuan Wang*, Guo Cao, Wah Yang, Shuqing Yu, Hening Zhai and Yunlong Pan







Yang *et al. BMC Surgery* (2015) 15:88
DOI 10.1186/s12893-015-0074-5

OAGB for Low BMI

Table 2 Preoperative and postoperative demographic and clinical characteristics

Parameter	Before	8 days	30 days	90 days	6 months	1 year	2 years	3 years	4 years	5 years	6 years	7 years
BMI (kg/m^2)	33.4±3.3	32.2±2.6	31.9±2.4	29.4±2.2	25.9±2.4	23.2±2.8	23.8±3.6	24.0±3.9	24.2±2.6	24.5±2.4	24.7±3.1	24.9±2.4
Waist (cm)	104±8.2	98.4	96.8	92.6	86.4	82.5	81.0	80.0	81.2	81.5	82.5	82.0
HbA1c (%)	10.7±1.5	–	–	–	–	6.2±0.5	6.0±0.2	5.4±1.2	5.2±1.0	5.8±0.4	5.0±1.6	5.7±1.8
EWL (%)	–	–	13.3	36.6	69.6	94.6	89.0	87.5	85.0	82.2	80.5	78.5
Mean weight (kg)	93±5.8	–	89±3.8	82±2.8	72±2.4	64.±3.4	66±3.2	67±3.1	67±3.4	68±3.9	69±3.2	69±3.3

Table 4 Postoperative diabetes remission

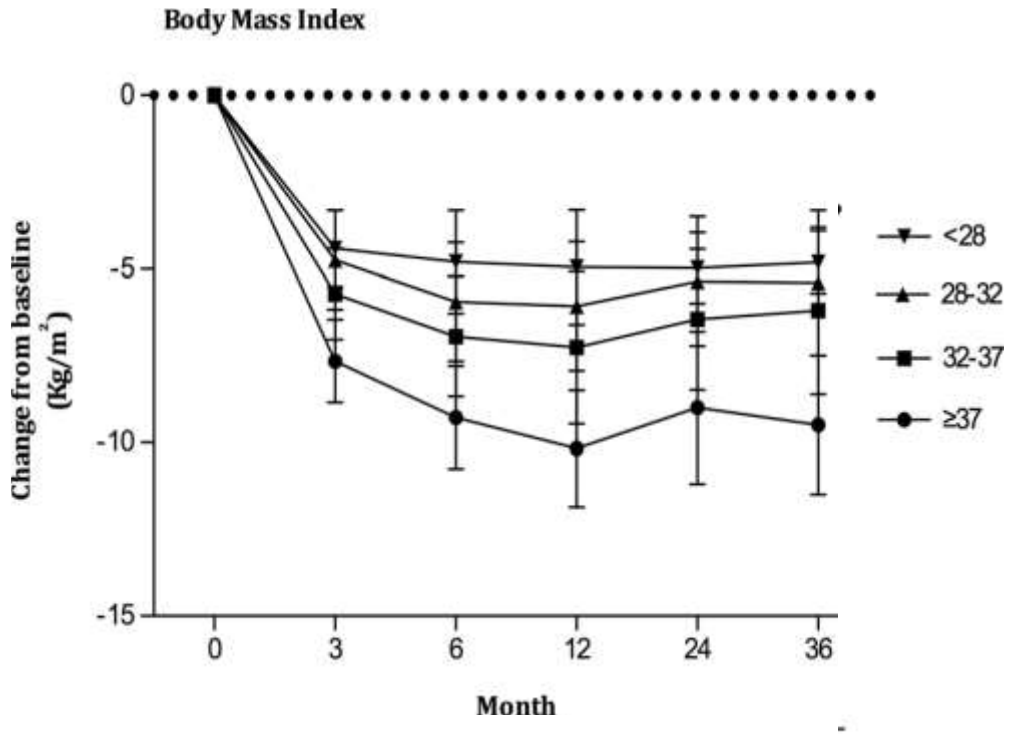
Years (no. of patients)	1 year (22)	2 years (38)	3 years (61)	4 years (71)	5 years (81)	6 years (93)	7 years (108)
Complete remission, % (no.) HbA1c <6 %, FPG <110 mg/dl	64 (14)	66 (25)	67 (41)	66 (47)	63 (51)	60 (56)	53 (58)
Partial remission, % (no.) HbA1c <6.5 %	18 (4)	13 (5)	20 (12)	15 (11)	7 (6)	8 (7)	15 (16)
Improvement, % (no.) HbA1c <7 %	18 (4)	21 (8)	11 (7)	14 (10)	23 (18)	20 (19)	18 (19)
Relapse, % (no.)	0	0	2 (1)	5 (3)	7 (6)	12 (11)	14 (15)

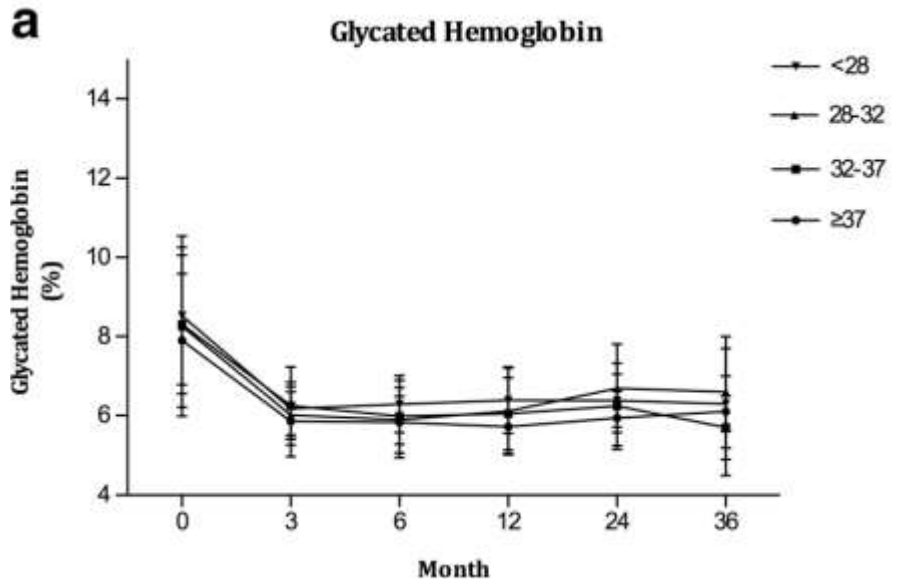
K S Kular Et Al. Obes Surg (2016) 26:1457–1462

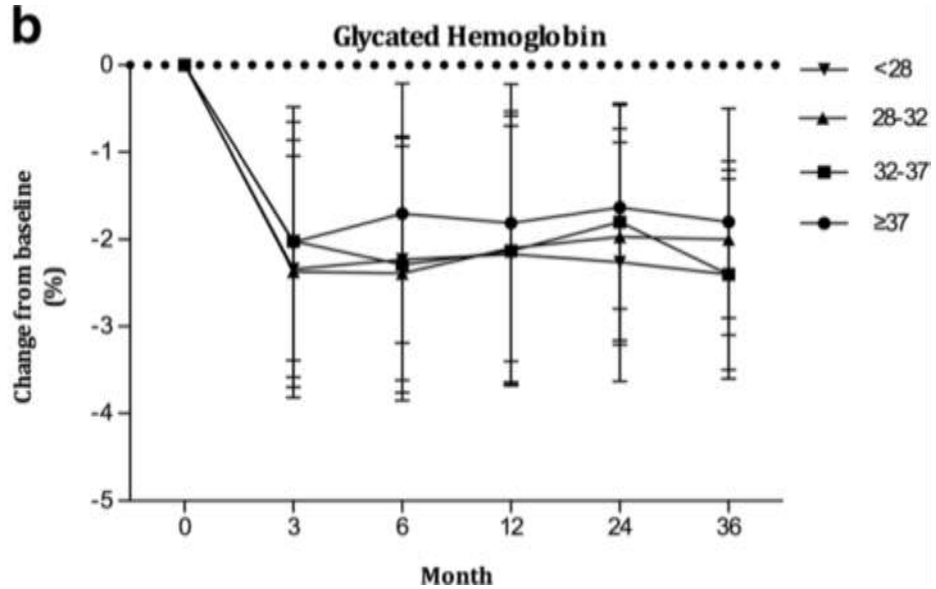
OBES SURG (2017) 27:134–142
DOI 10.1007/s11695-016-2262-5

ORIGINAL CONTRIBUTIONS

Effect of Roux-en-Y Gastric Bypass on Remission of T2D: Medium-Term Follow-up in Chinese Patients with Different BMI Obesity Class







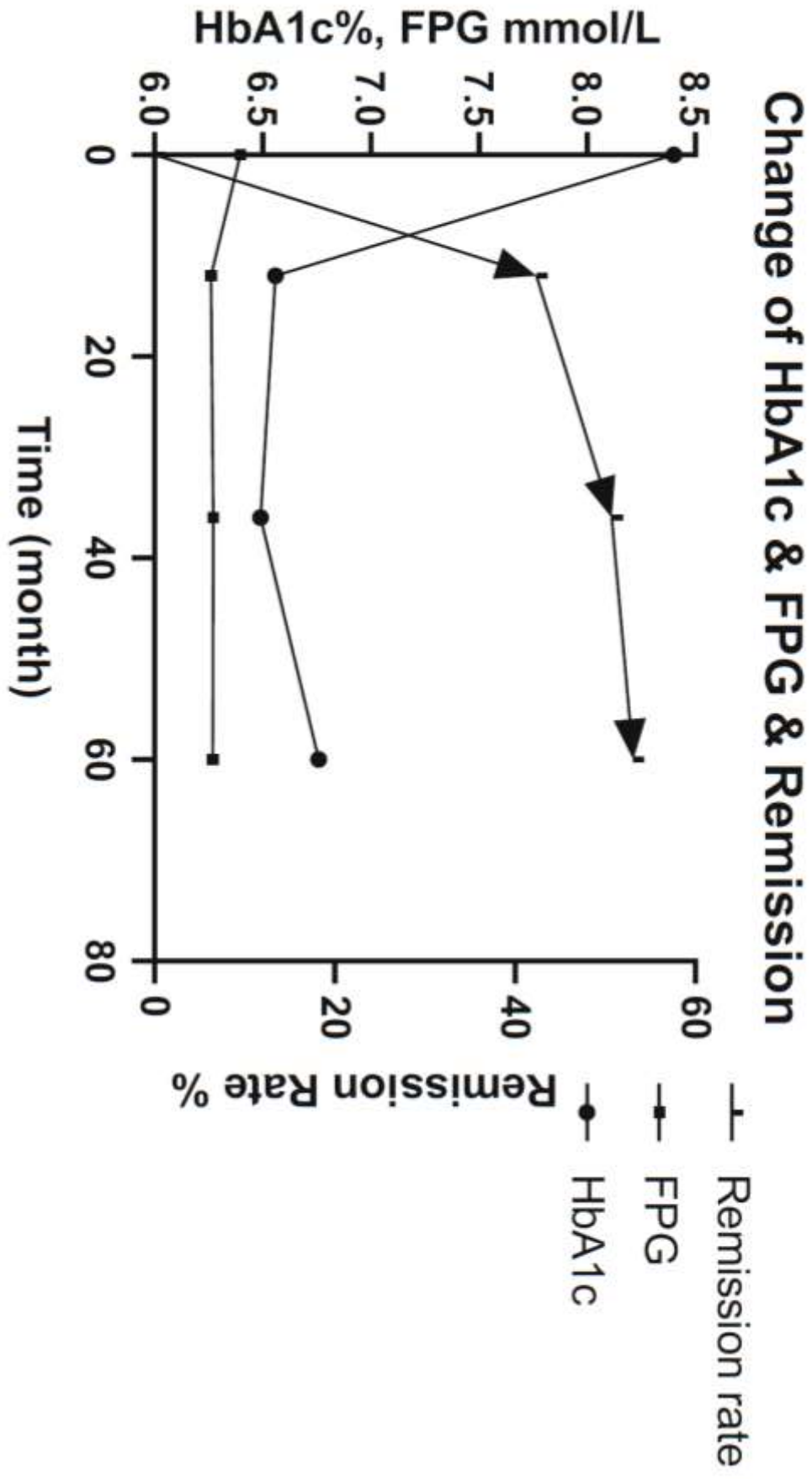
Hongwei Zhang et al. OBES SURG (2017) 27:134–142

Obesity Surgery (2021) 31:4083–4092
https://doi.org/10.1007/s11695-021-05520-9

ORIGINAL CONTRIBUTIONS

Is Bariatric Surgery Effective for Chinese Patients with Type 2 Diabetes Mellitus and Body Mass Index < 35 kg/m^2? A Systematic Review and Meta-analysis

Yichen Li[1] · Yijie Gu[2] · Yujia Jin[3] · Zhongqi Mao[1]

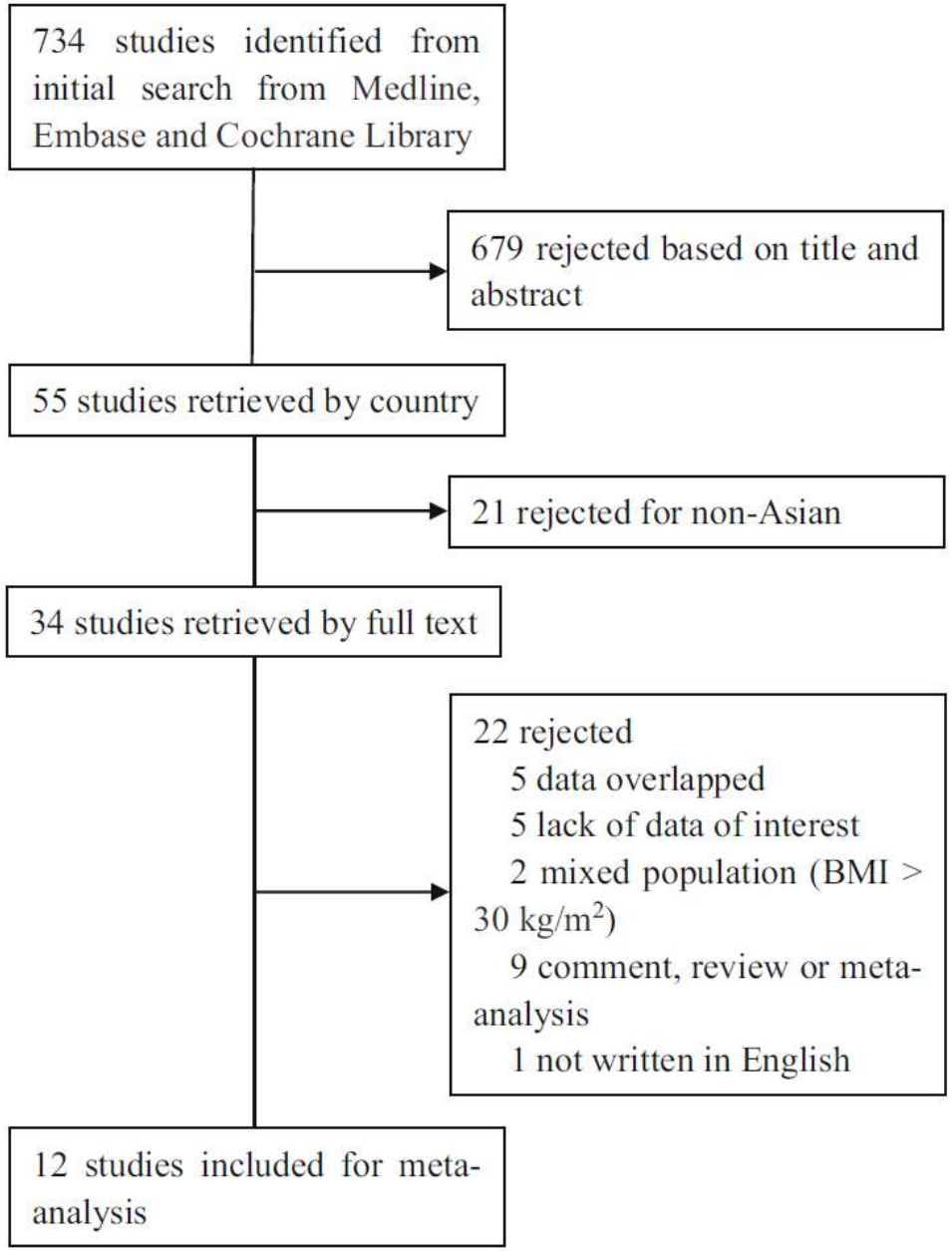


Obesity Surgery
https://doi.org/10.1007/s11695-019-03861-0

ORIGINAL CONTRIBUTIONS

The Effect of Bariatric Surgery on Asian Patients with Type 2 Diabetes Mellitus and Body Mass Index < 30 kg/m^2: a Systematic Review and Meta-analysis

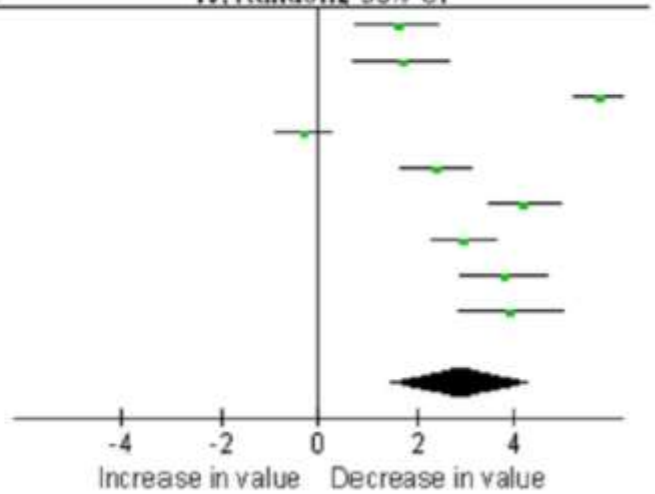
Guangnian Ji[1] · Pengzhou Li[1] · Weizheng Li[1] · Xulong Sun[1] · Zhaomei Yu[1] · Rao Li[1] · Liyong Zhu[1] · Shaihong Zhu[1]



b

Study or Subgroup	Before surgery Mean	SD	Total	One year after surgery Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Chen 2013	22.3	1.5	35	20.7	2.1	35	11.1%	1.60 [0.75, 2.45]
Cui 2015	23.4	2.8	58	21.7	2.7	58	10.9%	1.70 [0.70, 2.70]
Di 2016	28.2	1.2	66	22.5	1.8	65	11.3%	5.70 [5.18, 6.22]
Heo 2013	23.1	1.3	31	23.4	0.7	15	11.3%	-0.30 [-0.88, 0.28]
Kim 2014	25.3	3.2	172	22.9	3	107	11.2%	2.40 [1.66, 3.14]
Lee 2015	26.9	2.2	80	22.7	2.5	80	11.2%	4.20 [3.47, 4.93]
Liang 2015	24.68	2.12	86	21.72	2.43	86	11.2%	2.96 [2.28, 3.64]
Malapan 2014	24.4	1.8	29	20.6	1.7	29	11.0%	3.80 [2.90, 4.70]
Yin 2014	24.7	2.05	28	20.8	2.1	28	10.8%	3.90 [2.81, 4.99]
Total (95% CI)			585			503	**100.0%**	**2.88 [1.47, 4.30]**

Heterogeneity: $Tau^2 = 4.52$; $Chi^2 = 261.94$, df = 8 ($P < 0.00001$); $I^2 = 97\%$
Test for overall effect: $Z = 4.00$ ($P < 0.0001$)

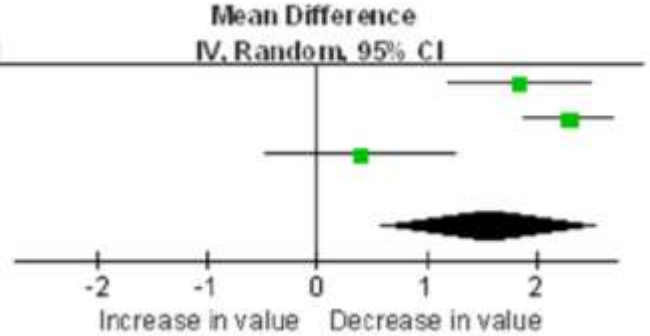


BMI 1 year

c

Study or Subgroup	Before surgery Mean	SD	Total	Two years after surgery Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Ke 2017	8.24	2.16	47	6.39	0.85	47	33.4%	1.85 [1.19, 2.51]
Kim 2014	9	1.7	172	6.7	1.4	65	36.6%	2.30 [1.88, 2.72]
Wang 2016	8.2	1.8	40	7.8	2.2	40	30.0%	0.40 [-0.48, 1.28]
Total (95% CI)			259			152	**100.0%**	**1.58 [0.59, 2.57]**

Heterogeneity: $Tau^2 = 0.66$; $Chi^2 = 14.56$, df = 2 ($P = 0.0007$); $I^2 = 86\%$
Test for overall effect: $Z = 3.11$ ($P = 0.002$)

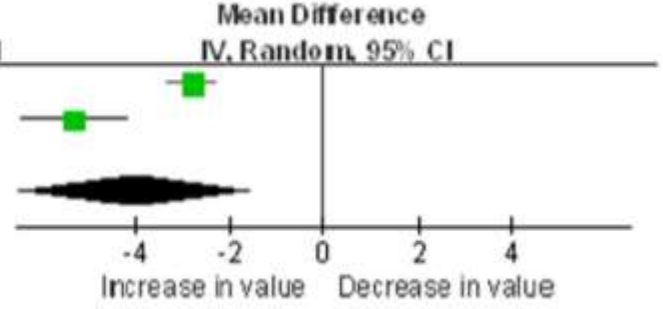


HbA1c 2 year

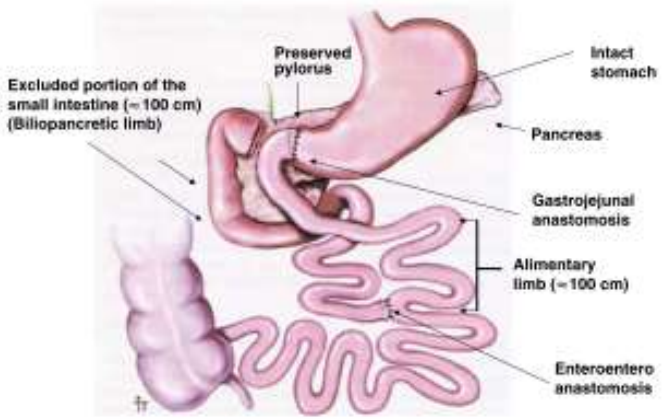
b

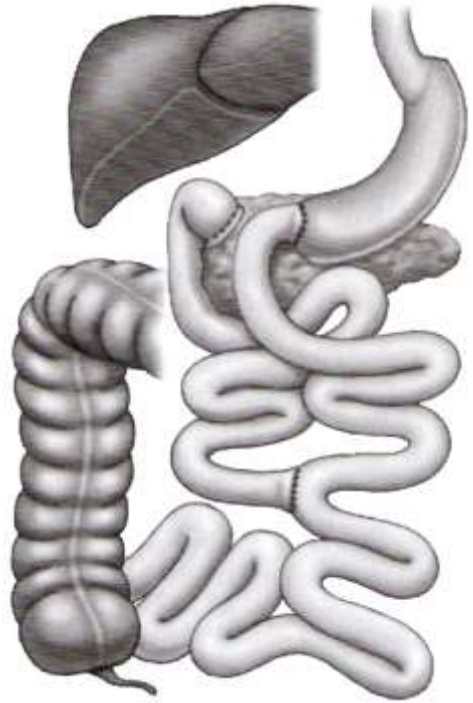
Study or Subgroup	Before surgery Mean	SD	Total	One year after surgery Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Chen 2013	4.1	0.9	35	6.9	1.3	35	52.0%	-2.80 [-3.32, -2.28]
Cui 2015	5.6	1.7	58	10.9	4	58	48.0%	-5.30 [-6.42, -4.18]
Total (95% CI)			93			93	**100.0%**	**-4.00 [-6.45, -1.55]**

Heterogeneity: $Tau^2 = 2.93$; $Chi^2 = 15.74$, df = 1 ($P < 0.0001$); $I^2 = 94\%$
Test for overall effect: $Z = 3.20$ ($P = 0.001$)

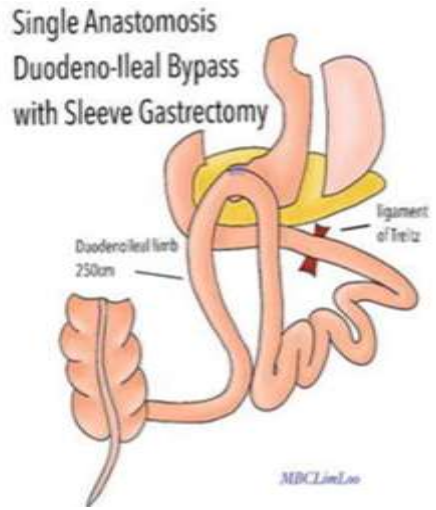


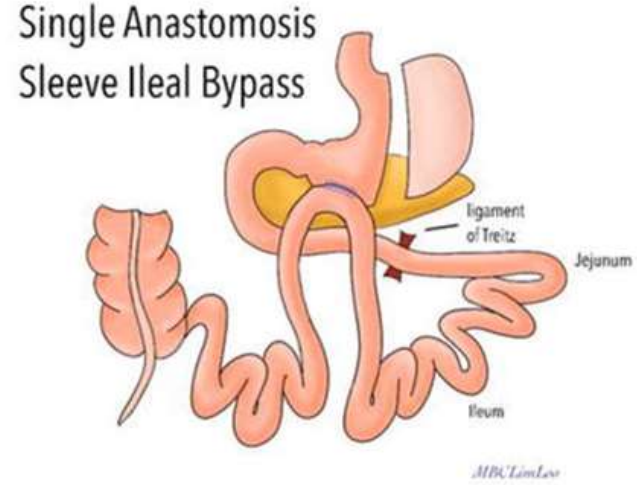
GLP-1 2 Year

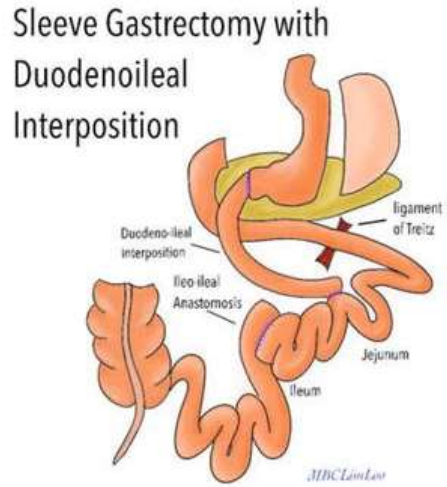


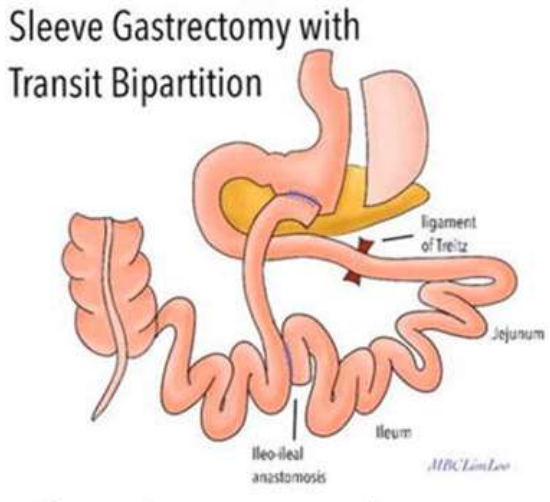


OBES SURG (2009) 19:1341–1345









Thank you