الجامعة السورية الخاصة
كلية الطب البشري
قسم الجراحة

قراءة في دورالجراحة الاستقلابية في معالجة الداء السكري الكهلي النموذج الثاني

أ.د.عاصم قبطان

diabetes2 and type 1 Type

- Diabetes arises when the beta cells in the Pancreas fail to produce enough of the hormone insulin <<<<

  Type 1 diabetes

- When the body cannot effectively use the insulin produced <<<<

  Type 2 diabetes.

- يحدث الداء السكري بسبب قصور في انتاج الإنسولين الكافي لمتطلبات الاستقلاب و هذا يسمى

  لنموذج الأول :

  داء السكر الشبابي

- عندما يتعذر استعمال الإنسولين المنتج من البانكرياس بشكلٍ فعال ، ينتج عن ذلك حدوث :

  النموذج الثاني :

  داء السكر المكتسب

Weight gain and insulin resistance

تؤدي البدانة إلى حدوث المقاومة لفعل الإنسولين من خلال عدة آليات :

- تراكم الشحوم يحرض على حدوث مقاومة لفعل الإنسولين .من خلال تغيرات في الآليات الفيزيولوجية الإمراضية الهرمونية و الإفرازية ، حيث تتراجع وظائف الحماية الهرمونية الإفرازية كلما ازدادت نسبة الخلايا الشحمية و بشكلٍ خاص في البطن .
- تؤدي حياة الدعة و قلة الحركة و فرط الوزن إلى حدوث المقاومة للإنسولين .
- تؤدي المقاومة للإنسولين إلى زيادة الطلب على البانكرياس لإفراز كميات كبيرة من الإنسولين لتلبية حاجة الجسم لاستقلاب الغلوكوز المتراكم ، و مع مرور الزمن تتراجع قدرة البانكرياس على تلبية الطلب مما يؤدي لظهور الداء السكري سريرياً .

Weight gain leads to insulin resistance through several mechanisms:

- Fat accumulation induces insulin resistance through changes in its hormonal and other secretions. Protective hormones decline as fat cells expand, particularly in the abdomen.
- Physical inactivity, both a cause and consequence of weight gain, also contributes to insulin resistance .
- Insulin resistance places a greater demand on the pancreatic capacity to produce insulin, which also declines with age, leading to the development of clinical diabetes.

Original Article

Metabolic Surgery VERSUS Conventional Medical Therapy For Type 2 Diabetes

This article was published on March 26 / 2012

In The New England Journal Of Medicine

Duration of study is 28 months
From April 30/2009, through October 31/2011

Caterina Guidone, M.D., Amerigo Iaconelli, M.D., Laura Leccesi, M.D., Giuseppe Nanni, M.D., Alfons Pomp, M.D., Marco Castagneto, M.D.,Giovanni Ghirlanda, M.D., and Francesco Rubino, M.D

original article

Bariatric Surgery versus Intensive Medical Therapy for Diabetes — 3-Year Outcomes

This article was published on March 31/2014

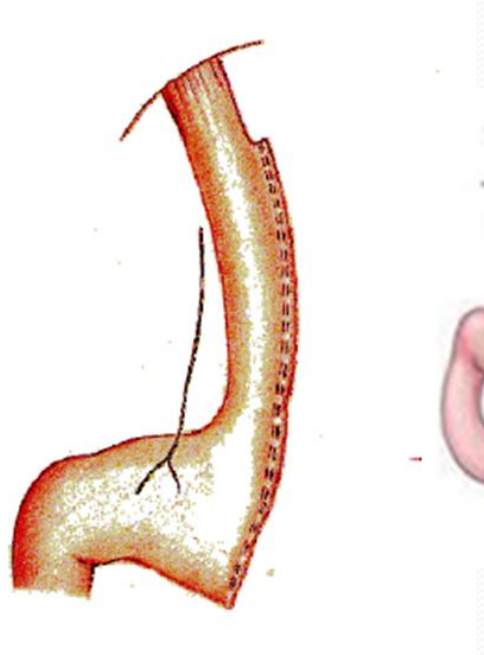
In The New England Journal Of Medicine

,.Philip R. Schauer, M.D., Deepak L. Bhatt, M.D., M.P.H., John P. Kirwan, Ph.D
,.Kathy Wolski, M.P.H., Stacy A. Brethauer, M.D., Sankar D. Navaneethan, M.D., M.P.H
,.Ali Aminian, M.D., Claire E. Pothier, M.P.H., Esther S.H. Kim, M.D., M.P.H
,.Steven E. Nissen, M.D., and Sangeeta R. Kashyap, M.D
for the STAMPEDE Investigators

Surgical Treatment and Medications Potentially Eradicate Diabetes Efficiently (**STAMPEDE(**

Restrictive Approach
تحديد الوارد

عمليـة طـي المعدة



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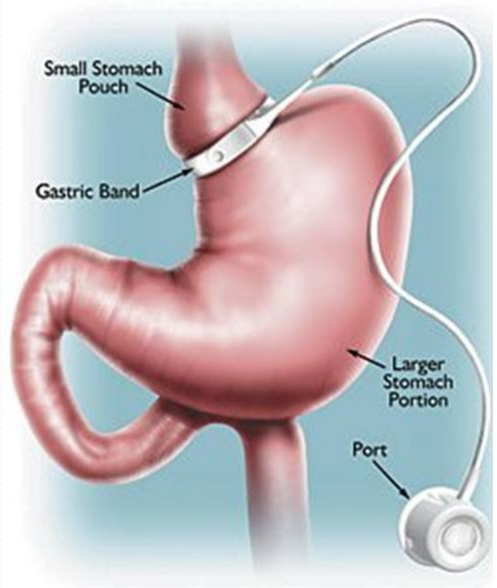
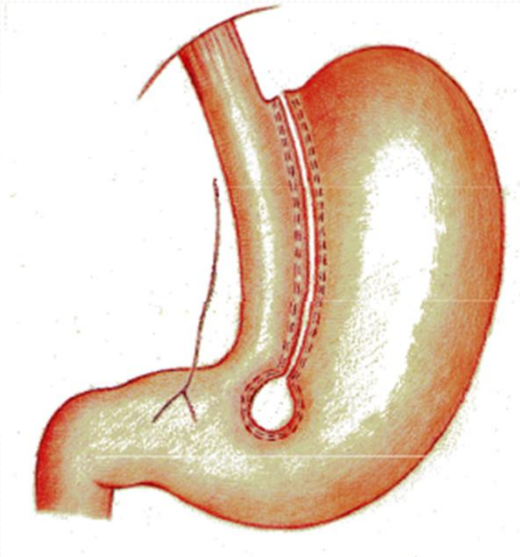


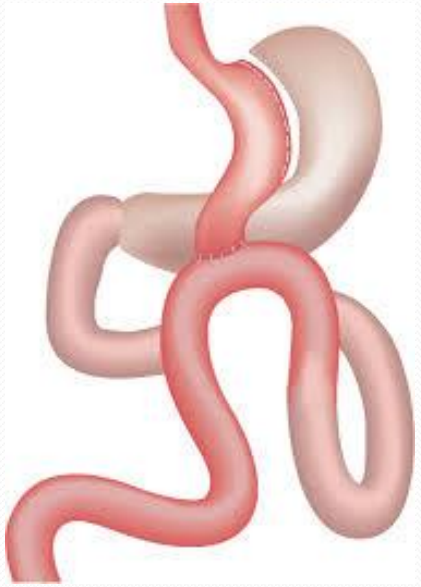
عملية وضع حلقة حول المعدة
قابلة للتصغير و التكبير



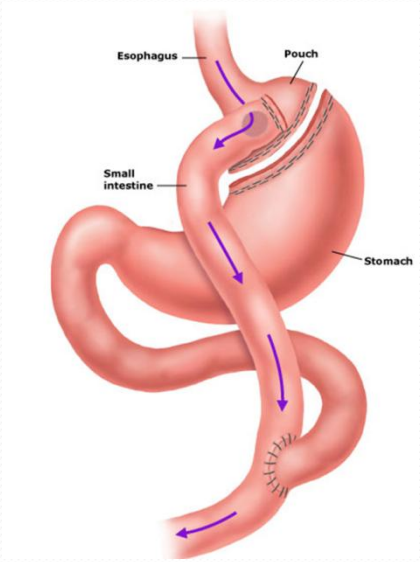
عملية قطع المعدة القائم

وضع بالون
في جوف المعدة

Mal absorption Approach
إحداث سوء الإمتصاص



تحويلة المعدة الصغيرة



التحويلة المعدية المعوية

التحويلة المعدية المعوية بواسطة منظار المعدة

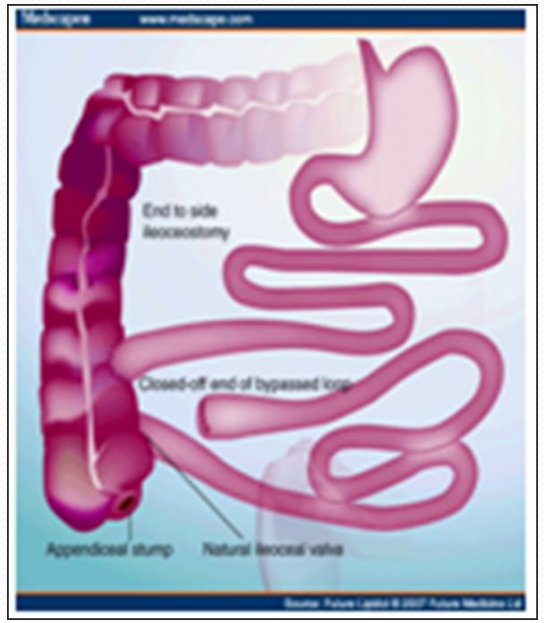
إجراءات الجراحة الاستقلابية في معالجة الداء السكري 2

التحويلة البانكرياسية العفجية

عملية تبادلية الإثنا عشري

إجراءات الجراحة الاستقلابية في معالجة فرط الشحوم

تفيد هذه العملية في معالجة زيادة الشحوم في الدوران الدموي و التي تؤدي بشكلٍ غير مباشر إلى تراجع في حالات نقص التروية الدموية في شرايين القلب و الشرايين المحيطية و بالتالي هبوط في الضغط الشرياني



عناصر الدراسة

Inclusion criteria

The age of 30 to 60 years

BMI ≥ 35

History of type 2 diabetes of at least 5 years

Glycated hemoglobin level ≥ 7.0%

The ability to understand and comply with the study protocol.

Exclusion criteria

History of type 1 diabetes

Diabetes secondary to a specific disease or glucocorticoid therapy

Previous bariatric surgery

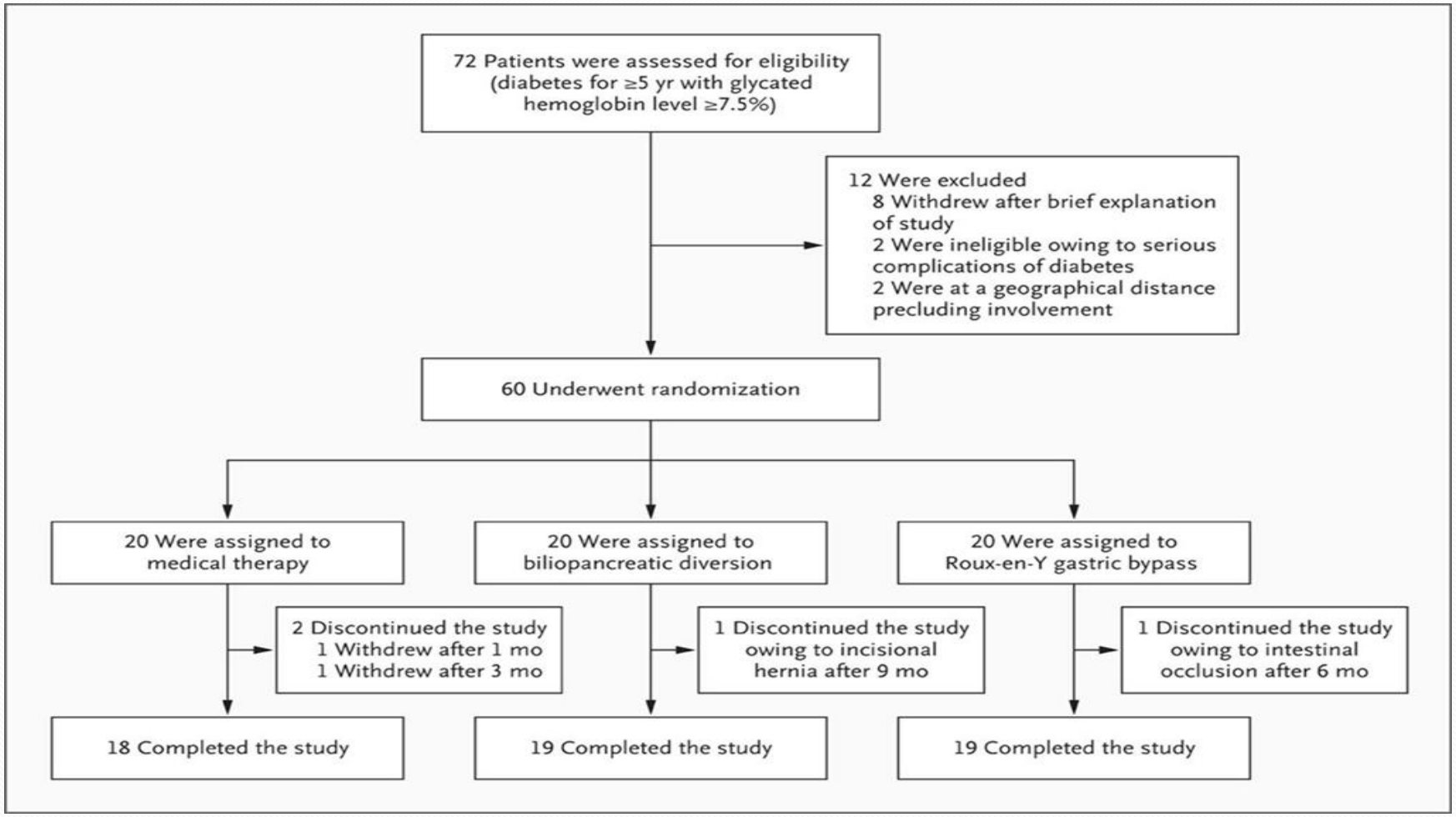
Pregnancy

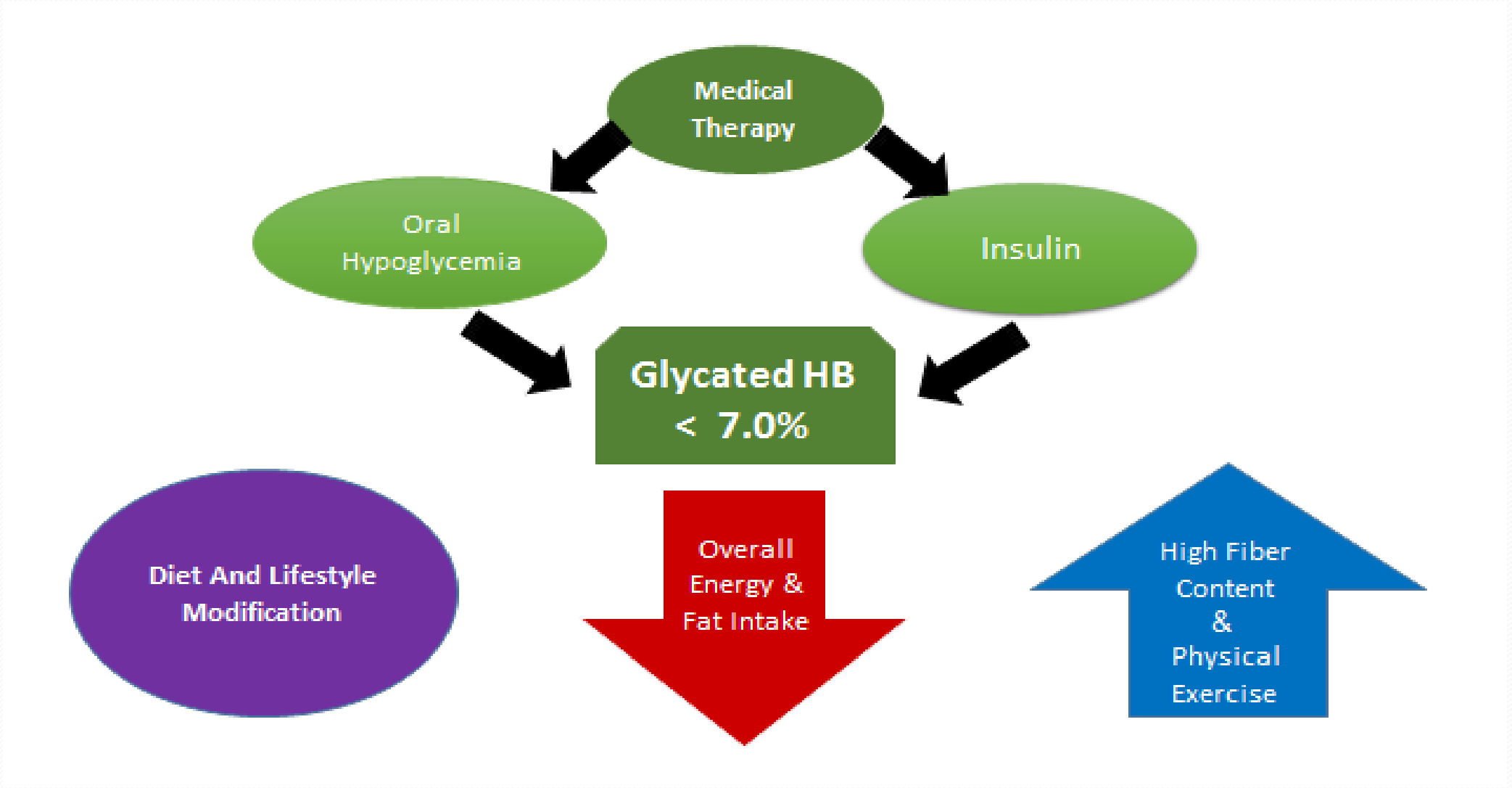
Other medical conditions requiring short-term hospitalization

Severe diabetes complications

Geographic inaccessibility

Enrollment and Outcomes




Medical Therapy
Oral Hypoglycemia
Insulin
Glycated HB < 7.0%
Diet And Lifestyle Modification
Overall Energy & Fat Intake
High Fiber Content & Physical Exercise

Laboratory Analyses

- Fasting plasma glucose
- Serum glycated hemoglobin levels
- Total cholesterol
- High-density lipoprotein (HDL) cholesterol
- Triglycerides
- Low-density lipoprotein (LDL) cholesterol

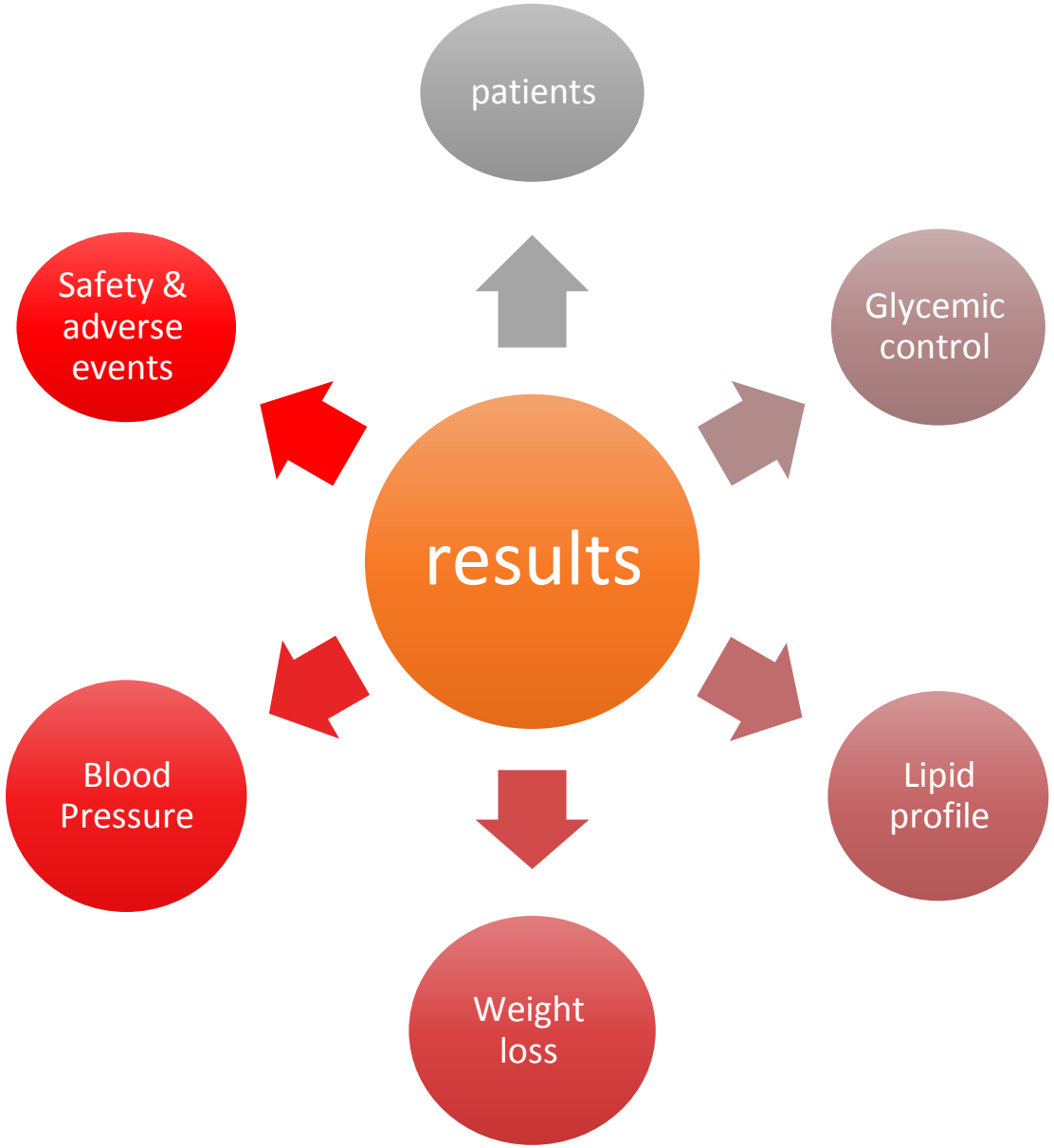
End Points at Two & Three Years

Primary end points

- Fasting plasma glucose 100>) mg/dl(
- Glycated HB level(<(6.5%

Secondary end points

- Body weight
- Arterial BP
- HDL , LDL & TG


patients
Safety & adverse events
Glycemic control
results
Blood Pressure
Lipid profile
Weight loss

Baseline Characteristics of the Patients

Table 1. Baseline Characteristics of the Patients.*

Characteristic	Medical Therapy (N=20)	Biliopancreatic Diversion (N=20)	Gastric Bypass (N=20)	P Value†
Age — yr	43.45±7.27	42.75±8.06	43.90±7.57	0.90
Fasting glucose — mmol/liter	9.94±3.43	9.70±3.44	9.55±3.35	0.93
Glycated hemoglobin — %	8.51±1.24	8.88±1.71	8.56±1.40	0.69
Cholesterol — mmol/liter				
Total	6.12±1.55	5.54±1.50	4.71±0.91	0.01
High-density lipoprotein	0.99±0.21	0.99±0.21	1.13±0.23	0.07
Low-density lipoprotein	3.99±1.40	3.41±1.21	2.83±0.84	0.01
Triglycerides — mmol/liter	2.49±0.80	2.49±1.21	1.66±0.86	0.01
Blood pressure — mm Hg				
Systolic	155.20±34.18	154.50±29.73	145.75±20.54	0.51
Diastolic	96.00±17.52	95.90±12.87	91.50±14.15	0.56
Weight — kg	136.40±21.94	137.85±30.35	129.84±22.58	0.57
Height — cm	172.95±10.66	174.35±9.59	169.75±10.10	0.34
Body-mass index‡	45.62±6.24	45.14±7.78	44.85±5.16	0.93
Waist — cm	126.90±14.68	130.35±19.73	125.40±16.58	0.65
Diabetes duration — yr	6.08±1.24	6.00±1.26	6.03±1.18	0.98
Male sex — no. (%)	10 (50)	10 (50)	8 (40)	0.77

* Plus–minus values are means ±SD. To convert the values for glucose to milligrams per deciliter, divide by 0.05551. To convert the values for cholesterol to milligrams per deciliter, divide by 0.02586. To convert the values for triglycerides to milligrams per deciliter, divide by 0.01129.

† P values are for all comparisons.

‡ The body-mass index is the weight in kilograms divided by the square of the height in meters.

2 Average Absolute Values and Percentage Changes at Y

Table 2. Average Absolute Values and Percentage Changes at 2 Years.*

Variable	Medical Therapy (N=18)	Biliopancreatic Diversion (N=19)	Gastric Bypass (N=19)	P Value†			
				Overall	Biliopancreatic Diversion vs. Medical Therapy	Gastric Bypass vs. Medical Therapy	Gastric Bypass vs. Biliopancreatic Diversion
Glucose (mmol/liter)	7.83±1.66	3.89±0.67	5.69±3.07	<0.001	<0.001	0.005	0.03
Change from baseline (%)	−14.37±11.93	−56.23±10.01	−37.81±33.75				
Glycated hemoglobin (%)	7.69±0.57	4.95±0.49	6.35±1.42	<0.001	<0.001	0.003	0.001
Change from baseline (%)	−8.39±9.93	−43.01±9.64	−25.18±20.89				
Cholesterol (mmol/liter)							
Total	4.91±0.87	2.77±0.81	4.27±0.77	<0.001	<0.001	0.31	<0.001
Change from baseline (%)	−16.82±11.60	−49.25±11.52	−6.83±27.03				
High-density lipoprotein	1.05±0.20	1.08±0.16	1.47±0.31	<0.001	0.61	<0.001	0.01
Change from baseline (%)	6.03±6.25	12.98±20.66	29.66±18.21				
Low-density lipoprotein	2.98±0.83	1.25±0.71	2.20±0.72	<0.001	<0.001	1.00	<0.001
Change from baseline (%)	−20.31±15.24	−64.63±15.93	−17.21±36.21				
Triglycerides (mmol/liter)	1.91±0.39	0.96±0.32	1.15±0.48	<0.001	<0.001	1.00	0.001
Change from baseline (%)	−18.28±7.84	−56.79±16.70	−21.17±41.23				
Blood pressure (mm Hg)							
Systolic	134.44±10.97	129.21±8.04	132.11±10.45	0.32	1.00	1.00	0.40
Change from baseline (%)	−11.15±12.71	−14.55±12.63	−9.02±7.51				
Diastolic	87.28±9.32	82.37±4.21	84.21±4.79	0.13	0.23	1.00	0.24
Change from baseline (%)	−7.14±11.51	−13.06±8.97	−7.30±9.42				
Weight (kg)	128.06±19.77	89.53±17.84	84.29±13.35	<0.001	<0.001	<0.001	1.00
Change from baseline (%)	−4.74±6.37	−33.82±10.17	−33.31±7.88				
Excess weight lost (%)	9.29±12.94	69.36±17.60	68.08±12.70	<0.001	<0.001	<0.001	1.00
Body-mass index	43.07±6.44	29.19±4.90	29.31±2.64	<0.001	<0.001	<0.001	1.00
Change from baseline (%)	−4.73±6.37	−33.82±10.17	−33.31±7.88				
Waist (cm)	116.33±12.14	103.53±16.94	98.58±13.06	<0.001	<0.001	<0.001	1.00
Change from baseline (%)	−7.69±7.80	−20.70±8.34	−19.91±8.44				

* Plus–minus values are means ±SD.

† P values for the overall comparisons were calculated with the use of analysis of variance. P values for the comparisons between each of the two surgical procedures and medical therapy and for the comparison between the two types of surgery were calculated with the use of the Bonferroni method in post hoc analyses.

Glycemic Control

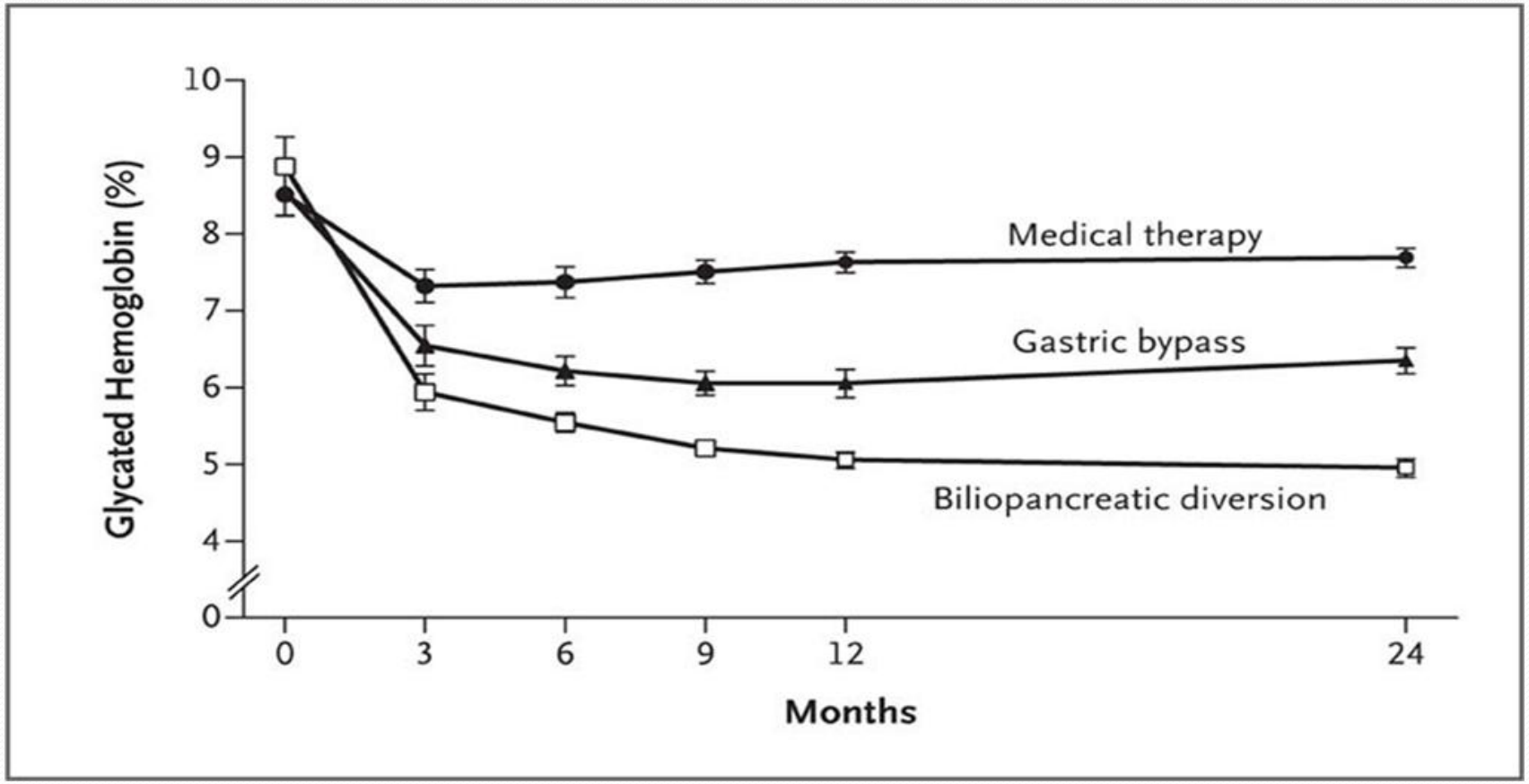
At 2 years, diabetes remission had occurred
in none of the patients receiving **medical therapy**.

undergoing **gastric bypass** **(%75)20 of 15** with

and **19 of 20 (95%)** undergoing **biliopancreatic diversion**

There was a significant association between study group and rate of remission.

Glycated Hemoglobin Levels during 2 Years of Follow-up



Weight Loss

At 2 years, patients in the two surgical groups **had greater percent reductions in average body weight from baseline than did patients receiving medical therapy**

A **significant difference** in weight loss between **the surgical and medical-therapy groups**, with **no significant difference** between **the two surgical groups**

Changes in weight were reflected by BMI changes, which **decreased:**

From 45.62±6.24 to 43.07±6.44 in the medical therapy group

From 44.85±5.16 to 29.31±2.64 in the gastric bypass group

From 45.14±7.78 to29.19±4.90 in the biliopancreatic diversion group

in the biliopancreatic 29.19±4.90 to45.14±7.78 from &
diversion group

Lipid Profile

All lipid-profile measures (except for HDL cholesterol) were **significantly lower** among patients undergoing **biliopancreatic diversion** than among those receiving **medical therapy**

HDL cholesterol : **increased in all three study groups**.

After 2years, **total cholesterol levels normalized in 27.3% of patients in the medical-therapy group**, as compared with **100% of those in both the gastric bypass and biliopancreatic-diversion groups**

Triglyceride levels normalized in **0%, 85.7%, and 92.3%** of patients, respectively

72.7%, and 100%, 11.1%and HDL cholesterol levels in

Blood Pressure

Systolic and diastolic blood-pressure levels were significantly **reduced** in **all three study groups.**

Antihypertensive therapy **was reduced or discontinued** in
%70of patients receiving medical therapy,
%80of those undergoing gastric bypass ,
%85of those undergoing biliopancreatic diversion

Late Complications of Surgical Procedures

Table 3. Late Complications of Surgical Procedures.*

Complication	Biliopancreatic Diversion (N=19)	Gastric Bypass (N=19)
Incisional hernia (9 mo)	1 Male patient (5%)	0
Intestinal occlusion (6 mo)	0	1 Male patient (5%)
Iron-deficiency anemia	2 Female patients (11%)†	2 Female patients (11%)
Hypoalbuminemia (albumin, <3.5 g/dl)	1 Female and 1 male patient (11%)†	0
Osteopenia (BMD T score, –2)	1 Female patient (5%)	0
Osteoporosis (BMD T score, –2.7)	1 Female patient (5%)†	0

* The listed metabolic complications developed 9 to 18 months after the operations. BMD denotes bone mineral density at the femoral neck on dual-energy x-ray absorptiometry.
† One female patient had multiple complications.

The Massage

Comparing the optimized conventional medical therapy with two types of bariatric surgery (gastric bypass and biliopancreatic diversion) in patients with type 2 diabetes with a BMI of 35 or more.

The results indicated that at 2 years and 3 years of two different studies: Both bariatric and metabolic surgery were far more effective than conventional medical therapy in the control of hyperglycemia in such patients of over weight and severe obesity.

يقول البروفسور كورت رئيس قسم الجراحة في جامعة ستانفورد في كاليفورنيا ، الولايات المتحدة الأمريكية : (تصور أن يراجعك مريض في العيادة الخارجية بشكوى داء سكري وهو يتناول معالجة فموية أو بالإنسولين ، و حمية قليلة الملح لإصابته بارتفاع التوتر الشرياني ، و يسألك عن تدبير للداء السكري ، يبدو من السخف أن لا تنصحه بإجراء الجراحة الاستقلابية)

نقلاً عن مجلة إنكلترا الجديدة الطبية 2007 .N. Engl. J. Med

Thank you