



Are there technical differences in the metabolic bypass?

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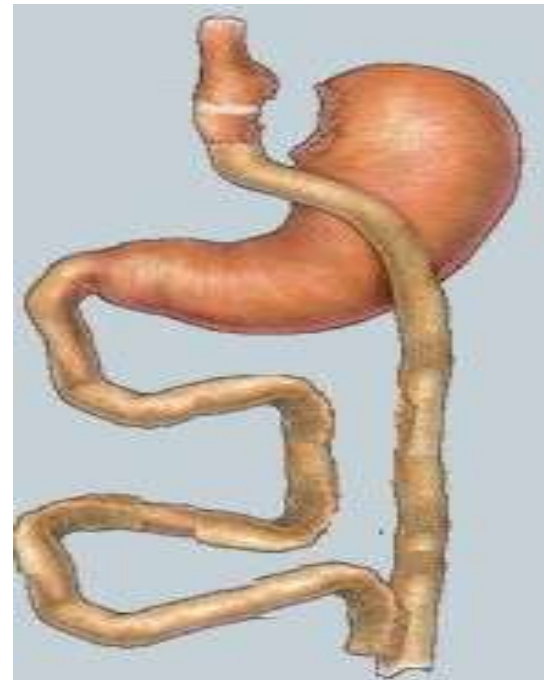


Is it not the same technique?

Classic Bypass



Metabolic Bypass



Why?

- * Different indications
- * Different patients
- * Different pathophysiology
- * Different objectives
- * Different results

Different Indications

Bariatric Surgery

- * BMI over 40kg/m²
- * BMI over 35kg/m² + comorbidities

Metabolic Surgery

- * BMI below 35kg/m²
- * Metabolic syndrome
 - * Waist circumference ♀>80 ♂>94
 - * Triglycerides >150 mg/dL
 - * HDL cholesterol ♀<39 ♂<35
 - * Blood pressure 140/ 90 mm Hg
 - * Fasting glucose >110 mg/dL
 - * Microalbuminuria ≥ 30 mg/g creatinine

Different patients

Bariatric Patients

- * BMI over 35-40kg/m²
- * Obesity related comorbidities
- * Obesity related complications
- * Body composition
 - * Predominancy of fat
- * Altered inflammatory patterns

Metabolic Patients

- * BMI below 35kg/m²
- * Diabetes related comorbidities
- * Metabolic related complications
- * Body composition
 - * Different distribution of fat
- * Highly altered inflammatory patterns

Different tissues

- * Metabolic patients usually show
 - * More dense fat
 - * Shorter mesenterium
 - * Thiner bowel walls

Technically More Demanding Procedures

Different Pathophysiology

Bariatric Surgery

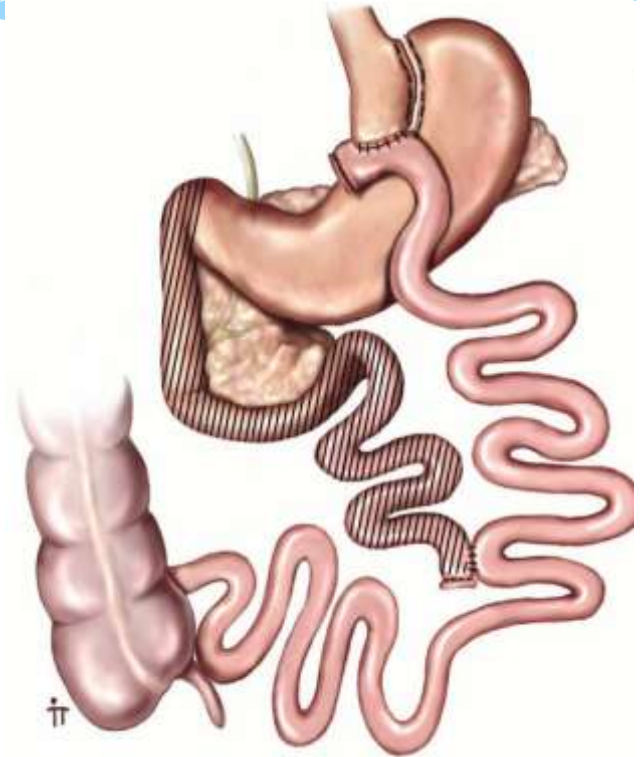
- * Restrictive procedure
 - * Small pouch
- * Mild malabsorption
 - * Short biliopancreatic limb
 - * Long common channel

Metabolic Surgery

- * Not restrictive procedure
 - * Bigger pouch
- * Duodenal exclusion + Hindgut Theory
 - * Long biliopancreatic limb

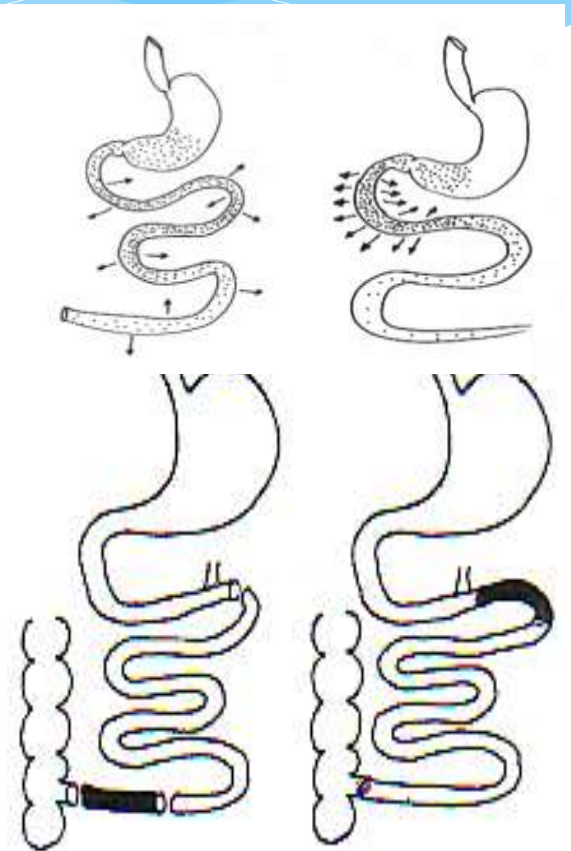
Different Pathophysiology

- “Foregut”
 - Duodenal exclusion
 - Proximal bowel bypass



Different Pathophysiology

- “Hindgut”
 - Ileal early food stimulation
 - “Ileal break”



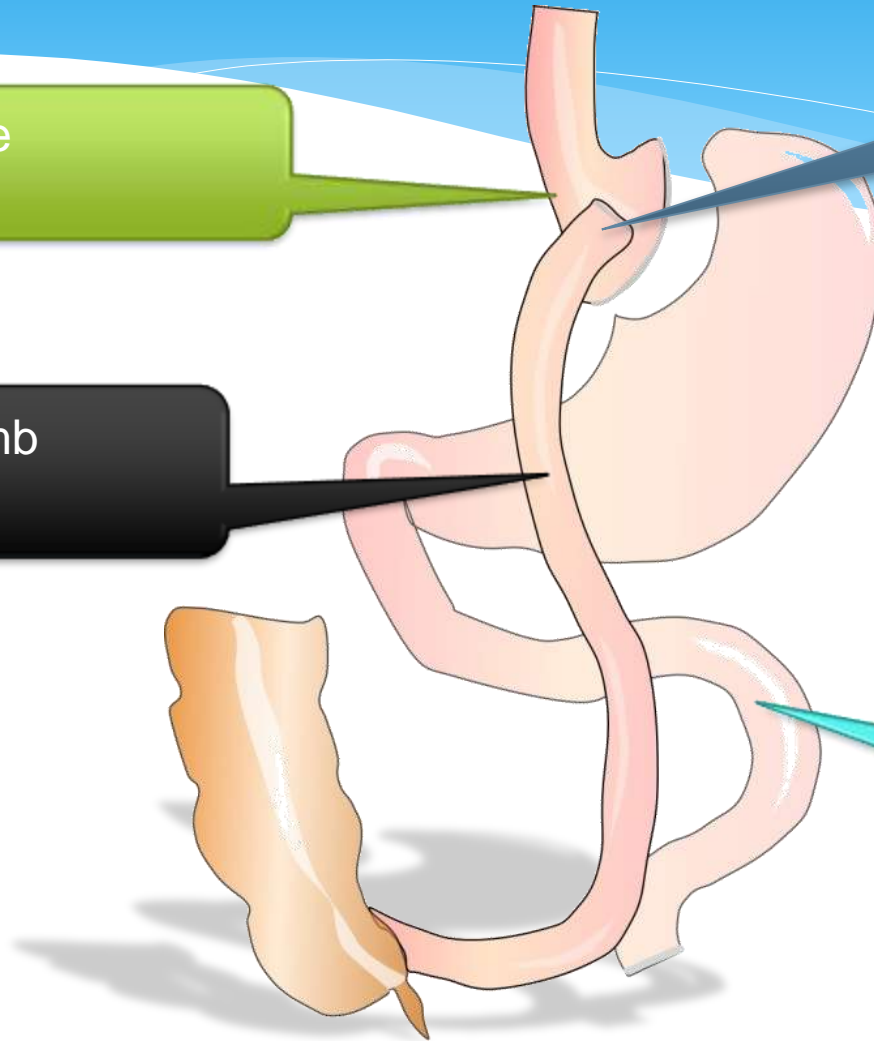
Metabolic Bypass

Double size
Pouch

Non calibrated
anastomosis

Alimentary limb
1m

BP limb
2m



Technical issues

- * Bigger pouch + Bigger anastomosis
- * More bowel to be mobilized
 - * Bigger risk of serosa lesions
- * Distal Roux anastomosis
 - * Bigger mesenterium defects
 - * Technically demanding
- * Thicker and shorter mesenterium
 - * Risk of mesenteric disruption

Different Objectives

Bariatric Surgery

1. Weight Loss
2. Comorbidities resolution
3. Good quality of life

Metabolic Surgery

1. Comorbidities resolution
2. Not too much weight to lose
3. Good quality of life

Different Results

Bariatric Surgery

- * Weight loss up to 57%EWL
- * Resolution of Comorbidities
 - * T2DM 67%
 - * Dyslipidemia 80%
 - * Hypertension 86%
 - * Sleep Apnea 79%

Higa et al. SOARD 2011

Metabolic Surgery

- * Weight loss up to 50%EWL
- * Resolution of Comorbidities

	Schaer et al. NEJM 2012 (RYGB group only)	Mingrone et al. NEJM 2012 (RYGB group only)
T2DM	42%	75%
Dyslipidemia	30%	85.7% to 100%
Hypertension	41%	80%

Brethauer et al. NEJM 2012. Data from STAMPEDE study
Mingrone et al. NEJM 2012

Results from Metabolic Bypass

- * Data from Dr. Mario Nora
- * Serviço do Cirurgia do CHEDV. Porto (Portugal)
- * Prospective Study of Metabolic Bypass in Diabetic Patients



Metabolic Syndrome and bariatric surgery

Patient demographics and length of follow-up (n=153)

Patient characteristics at baseline	Number
Age (years)	48.5±0.7
Male/Female	24.0:129.0 (15.7%:84.3%)
Body Weight (kg)	113.9±1.4
BMI (Kg/m²)	44.3±0.5
Under anti-diabetic treatment	101.0 (66.0%)
Under anti-hypertensive treatment	120.0 (78.4%)
Under anti-dyslipidemic treatment	66.0 (44.3%)
Mean follow-up time (years)	2.4±0.1

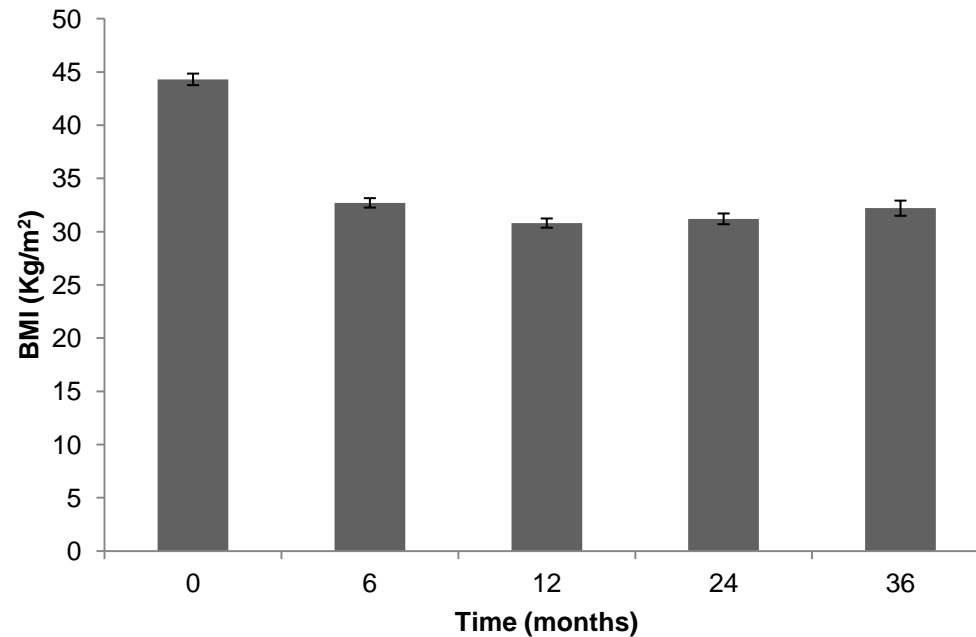


Metabolic Syndrome and bariatric surgery

Follow-up time (months)	0	6	12	24	36
Patients	153.0	153.0	142.0	112.0	76.0
Patients with Metabolic Syndrome	153.0	103.0	43.0	41.0	31.0
Metabolic Syndrome remission rate (%)	0.0%	32.7%	69.7%	63.4%	59.2%
Fasting glycemia (mg/dL)	136.4±4.8	95.0±2.4	90.4±1.1	93.7±1.6	93.8±1.9
Systolic blood pressure (SBP) (mm Hg)	147.2±1.5	140.4±1.7	138.3±1.5	139.0±1.7	143.9±2.0
Diastolic blood pressure (DBP) (mm Hg)	88.4±1.0	82.5±1.0	81.6±1.0	81.9±1.0	82.7±1.4
HDL (mg/dL)	45.5±0.8	44.8±1.0	52.0±0.9	56.5±1.0	56.4±1.6
Triglycerides (TG) (mg/dL)	171.7±7.4	104.0±3.2	94.5±3.3	100.7±5.0	104.6±5.4
Under anti-diabetic treatment	101.0 (66.0%)	33.0 (22.8%)	28.0 (19.9%)	32.0 (28.6%)	25.0 (32.9%)
Under anti-hypertensive treatment	120.0 (78.4%)	59.0 (40.7%)	50.0 (35.7%)	41.0 (36.9%)	33.0 (43.4%)
Under anti-dyslipidemic treatment	66.0 (44.3%)	13.0 (9.0%)	13.0 (9.4%)	12.0 (10.8%)	12.0 (15.8%)



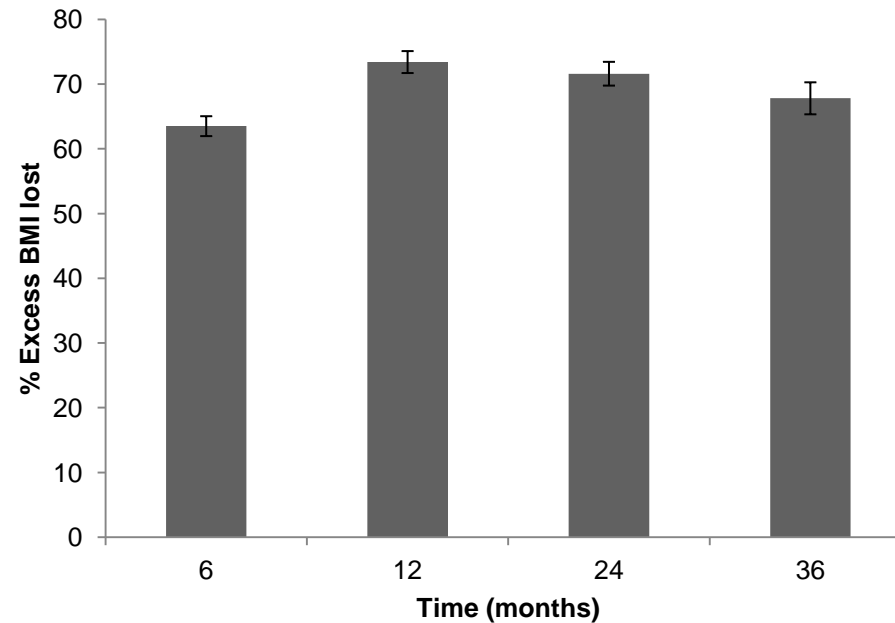
Body Mass Index (BMI)



(*** $p < 0.001$ from 6 months onwards)

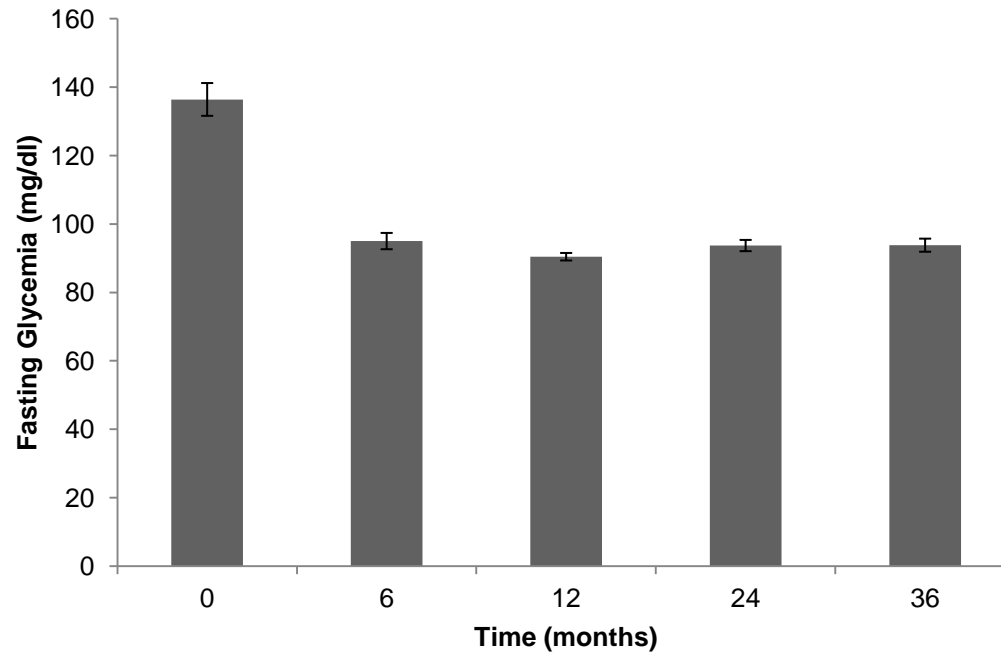


% Excess BMI Lost





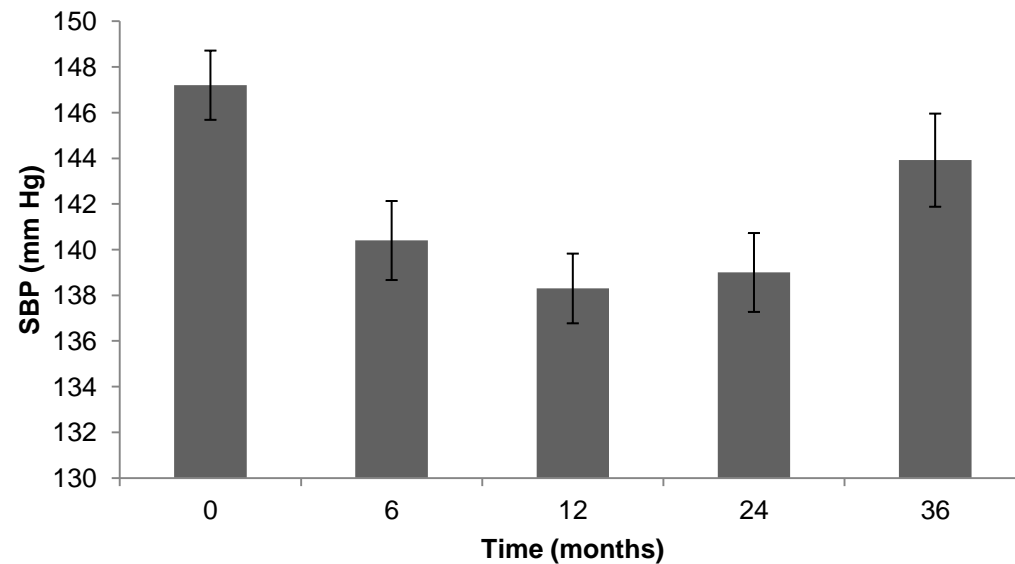
Fasting Glycemia (mg/dl)



(*p<0.001 from 6 months onwards)**



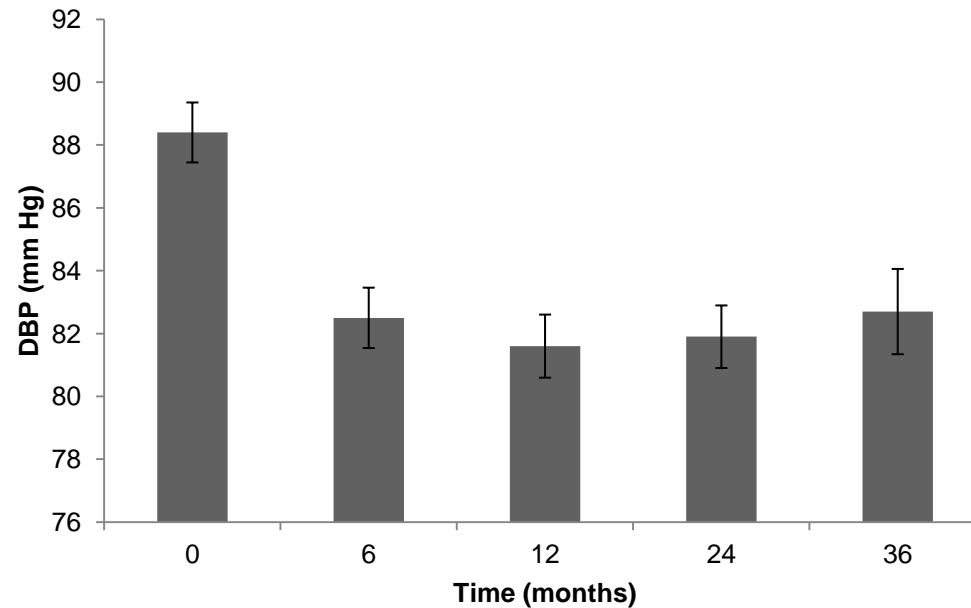
Systolic Blood Pressure (mmHg)



(p<0.01 for 6 months; ***p<0.001 for 12 and 24 months)**



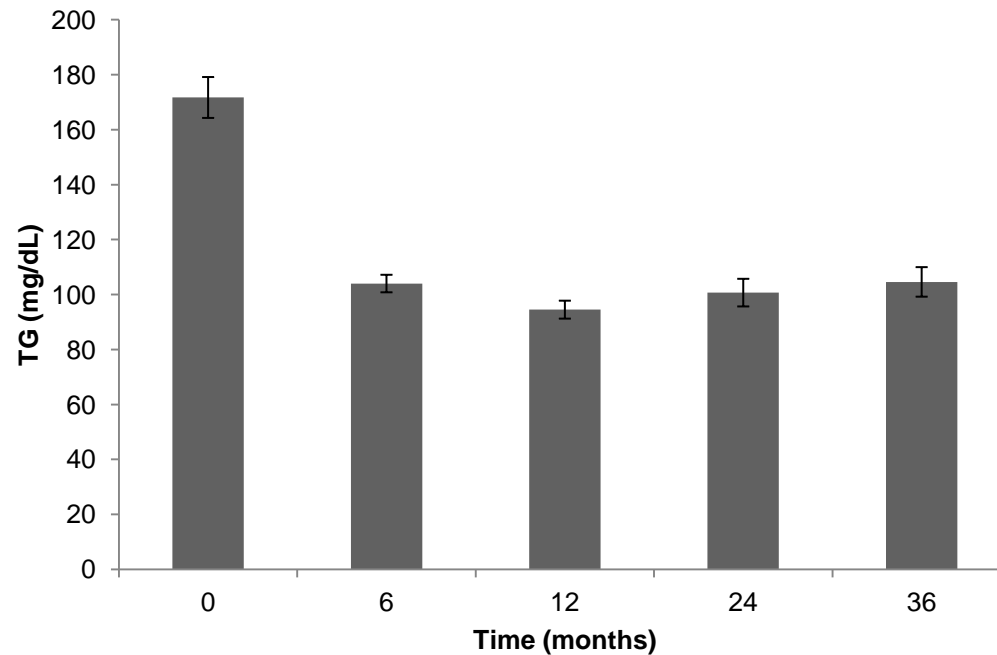
Diastolic Blood Pressure (mmHg)



(*** $p < 0.001$ from 6 months onwards)



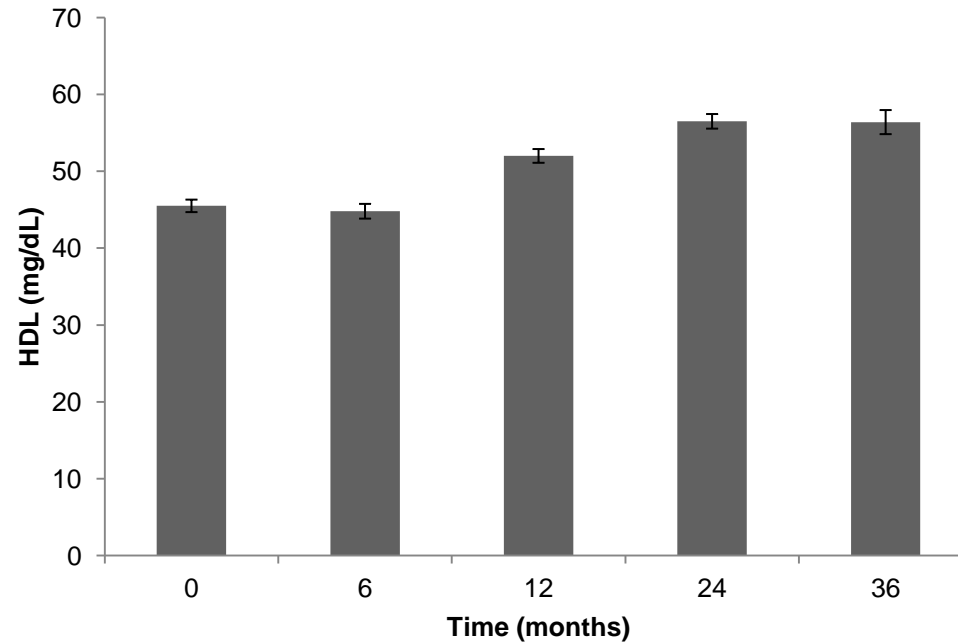
Triglycerides (mg/dl)



(*p<0.001 from 6 months onwards)**



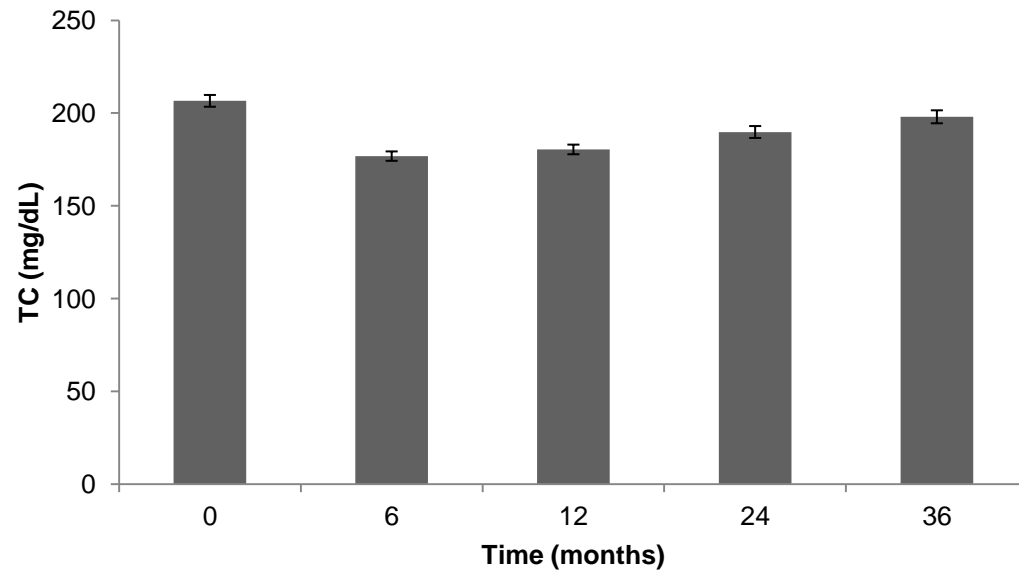
HDL - cholesterol



(*** $p < 0.001$ from 12 months onwards)



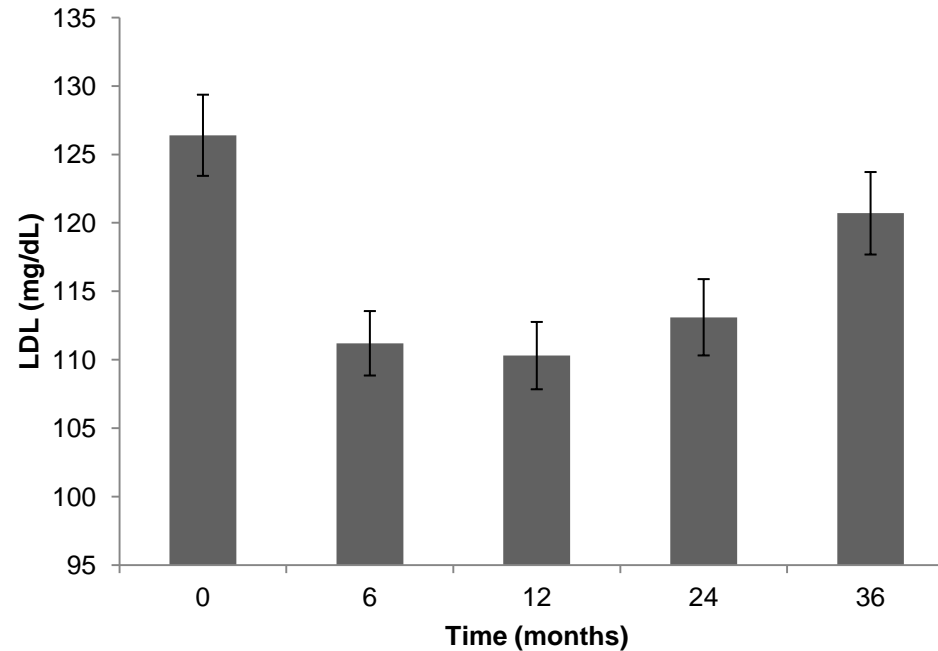
Total Cholesterol (TC)



(*** $p < 0.001$ for 6, 12 and 24 months)



LDL - Cholesterol



(*** $p < 0.001$ for 6 and 12 months; ** $p < 0.01$ for 24 months)

Conclusions

- * Metabolic bypass is a technical modification from the classical RYGB
- * Due to patients characteristics is
 - * Technically more demandant
 - * Has bigger risk of complications
 - * Has a different objective
 - * Has different results