

Supplementary Material

Table S1. Clinical and biochemical characteristics of the overall cohort at baseline (T0) and their post-surgical variations (T1) (n=87).

Demographic	T0	T1	Δ T0-T1	p-value
Age, yr. [IQR]	44 [35 – 53]	–	–	–
Sex, male (%)	23 (26.4)	–	–	–
Hypertension, n. (%)	31 (35.6)	–	–	–
Dyslipidemia, n. (%)	45 (51.7)	–	–	–
T2DM, no (%)	8 (9.2)	–	–	–
Morbidly obese, n. (%)	64 (73.6)	–	–	–
Active smokers, n (%)	23 (26.4)	–	–	–
Clinical Data				
Systolic BP, mmHg [IQR]	138 [130 – 150]	126 [118 – 130]	15 [3 – 22]	<0.001
Diastolic BP, mmHg [IQR]	88 [80 – 90]	80 [70 – 82]	10 [0 – 20]	<0.001
Weight, Kg [IQR]	120 [105 – 138]	88.1 [75.9 – 102.9]	29.4 [24.5 – 37.5]	<0.001
BMI, Kg/m ² [IQR]	45.0 [38.8 – 50.0]	33.2 [27.9 – 36.9]	11.0 [8.9 – 13.7]	<0.001
Waist circumference, cm [IQR]	129 [116 – 143]	107 [94 – 118]	24 [19 – 32]	<0.001
Hip circumference, cm [IQR]	139 [130 – 148]	114 [104 – 125]	22 [17 – 30]	<0.001
Waist-to-hip ratio, [IQR]	0.94 [0.88 – 0.98]	0.10 [0.85 – 0.97]	0.03 [-0.01 – 0.06]	<0.001
Waist to height ratio, [IQR]	0.79 [0.72 – 0.86]	0.64 [0.58 – 0.70]	0.15 [0.11 – 0.19]	<0.001
Electric bioimpedance analysis				
Fat mass, Kg [IQR]	57.5 [45.5 – 67.3]	32.7 [23.8 – 41.4]	23.1 [19.3 – 41.4]	<0.001
Lean mass, Kg [IQR]	59.2 [53.8 – 68.2]	53.4 [49.5 – 63.0]	5.8 [3.4 – 8.3]	<0.001
Ultrasound assessment				
Total visceral fat area, cm ² (IQR)	240 [205 – 297]	150 [109 – 181]	96 [60 – 134]	<0.001
Subcutaneous fat area, cm ² (IQR)	30 [23 – 38]	18 [14 – 25]	11 [5 – 25]	<0.001
Visceral to subcutaneous fat ratio, (IQR)	8.1 [6.3 – 11.3]	7.5 [5.9 – 9.4]	0.4 [-1.8 – 2.6]	0.262
Biochemical parameters				
GFR, mL/min (IQR)	116 [105 – 133]	116 [95 – 132]	3 [-12 – 14]	0.375
Serum total-c, mg/dL [IQR]	194 [173 – 219]	190 [167 – 213]	5 [-16 – 21]	0.369
Serum LDL-c, mg/dL [IQR]	108 [96 – 130]	113 [67 – 132]	-1 [-20 – 12]	0.499

Serum HDL-c, mg/dL [IQR]	49 [43 – 59]	56 [47 – 64]	-6 [-13 – 1]	<0.001
Serum TAG, mg/dL [IQR]	124 [88 – 188]	95 [75 – 120]	30 [0 – 87]	<0.001
VAI, [IQR]	4.4 [2.7 – 6.9]	2.8 [1.9 – 4.3]	1.4 0.3 – 3.3]	<0.001

Data are expressed as median [IQR] or number n (%). *p*-value refers to the comparison between T0 and T1. Statistically significant *p*-values are in bold.

T2DM: type 2 diabetes mellitus; BP: blood pressure, BMI: body mass index; GFR: glomerular filtration rate; total-c: total cholesterol; LDL-c: low-density lipoprotein cholesterol; HDL-c: high-density lipoprotein cholesterol; TAG: triglycerides, VAI: visceral adiposity index.

Table S2. Glycemic profile and circulating sclerostin in the overall cohort at baseline (T0) and their post-surgical variations (T1) (n=87).

	T0	T1	Δ	<i>p</i>-value
Fasting glycaemia, mg/dL [IQR]	95 (85 – 109)	79 (76 – 86)	16 (6 – 28)	<0.001
HbA1c, mmol/mol [IQR]	40 (37 – 44)	36 (32 – 38)	5 (4 – 8)	<0.001
Insulin, mU/mL [IQR]	16 (9 – 24)	6 (5 – 9)	9 (4 – 16)	<0.001
HOMA2-IR, [IQR]	2.1 (1.2 – 3.2)	0.8 (0.6 – 1.1)	1.2 (0.5 – 2.1)	<0.001
HOMA2-β, [IQR]	133.1 (93.7 – 176.9)	103.3 (83.4 – 134.2)	27.7 (3.3 – 60.0)	<0.001
HOMA2-S, % [IQR]	47.9 (31.8 – 84.8)	122.5 (89.3 – 169.7)	-68.2 (-100.5 – -42.7)	<0.001
Sclerostin, pg/mL [IQR]	14.5 [10.9 – 94.4]	118.9 [78.5 – 150.6]	-77.9 [-115.7 – -2.9]	<0.001

Data are expressed as median [IQR]. Statistically significant *p*-values are in bold.

HbA1c: glycosylated hemoglobin; HOMA: homeostatic model assessment for insulin resistance (IR), β cell function (β) and peripheral insulin sensitivity (S).

Table S3. Correlations of sclerostin with clinical, biochemical and inflammatory parameters.

	Sclerostin	
	<i>r</i>	<i>p</i>-value
Clinical Data		
Age	-0.026	0.808
Systolic BP*	-0.009	0.939
Diastolic BP	0.181	0.110
Weight	0.208	0.053
BMI	0.204	0.058
Waist circumference	0.238	0.026
Hip circumference	0.106	0.333
Waist-to-hip ratio	0.315	0.005
Waist-to-height ratio	0.234	0.029
Electric bioimpedance analysis		
Fat mass	0.218	0.044
Lean mass	0.209	0.053
Ultrasound assessment		
Total visceral fat area	0.220	0.045
Subcutaneous fat area	0.228	0.039
Visceral to subcutaneous fat ratio	-0.012	0.917
Biochemical parameters		
GFR, mL/min	0.030	0.787
Serum total-c	0.008	0.943
Serum LDL-c	0.045	0.682
Serum HDL-c	-0.076	0.488
Serum TAG	-0.038	0.729
VAI	-0.129	0.237
Glycemic profile		
Fasting glycaemia	0.077	0.478
HbA1c	0.134	0.250
Fasting insulin	0.277	0.010
HOMA2-IR	0.300	0.005
HOMA2-β	0.019	0.278
HOMA2-S	-0.218	0.045

p-value refers to the correlations performed by Spearman's rank correlation coefficient. Statistically significant *p*-values are in bold.

BP: blood pressure; BMI: body mass index; GFR: glomerular filtration rate; total-c: total cholesterol; LDL-c: low-density lipoprotein cholesterol; HDL-c: high-density lipoprotein cholesterol; TAG: triglycerides; VAI: visceral adiposity index; HbA1c: glycosylated hemoglobin; HOMA: homeostatic model assessment for insulin resistance (IR), β cell function (β) and peripheral insulin sensitivity (S).

Table S4. Logistic regression linking baseline sclerostin with post-surgical change in glycemic profile.

	Univariate		Adjusted	
	OR (95% CI)	p-value	OR (95% CI)	p-value
Fasting glycemia improvement				
Age	1.06 (1.01 – 1.11)	0.016	1.08 (1.02 – 1.14)	0.008
Sex, male	0.24 (0.09 – 0.67)	0.006	0.29 (0.07 – 1.14)	0.077
Weight loss	1.02 (0.96 – 1.09)	0.501	–	–
Δ BMI	1.09 (0.97 – 1.21)	0.140	–	–
Δ waist circumference	1.04 (0.99 – 1.09)	0.109	–	–
Δ Total visceral fat area	1.02 (1.01 – 1.03)	0.004	1.01 (0.99 – 1.02)	0.072
Δ Lean mass	0.92 (0.92 – 1.03)	0.377	–	–
Sclerostin	1.01 (1.00 – 1.02)	0.021	1.01 (0.99 – 1.02)	0.072
Improved HbA1c				
Age	1.07 (0.99 – 1.15)	0.052	–	–
Sex, male	0.24 (0.07 – 0.85)	0.027	0.35 (0.09 – 1.39)	0.350
Weight loss	1.03 (0.94 – 1.12)	0.516	–	–
Δ BMI	1.16 (1.00 – 1.33)	0.048	1.12 (0.96 – 1.30)	0.157
Δ waist circumference	1.02 (0.96 – 1.08)	0.599	–	–
Δ Total visceral fat area	1.01 (1.00 – 1.03)	0.051	–	–
Δ Lean mass	0.97 (0.88 – 1.06)	0.966	–	–
Sclerostin	1.02 (1.01 – 1.02)	0.011	1.01 (1.00 – 1.02)	0.037
Improved HOMA2-IR				
Age	1.02 (0.98 – 1.06)	0.319	–	–
Sex, male	0.33 (0.12 – 0.93)	0.035	–	–
Weight loss	0.94 (0.88 – 1.00)	0.060	–	–
Δ BMI	0.95 (0.86 – 1.06)	0.381	–	–
Δ waist circumference	1.00 (0.96 – 1.05)	0.903	–	–
Δ Total visceral fat area	1.00 (0.99 – 1.01)	0.635	–	–
Δ Lean mass	0.97 (0.92 – 1.03)	0.306	–	–
Sclerostin	1.01 (0.99 – 1.01)	0.522	–	–
Improved HOMA2-%S				
Age	0.98 (0.94 – 1.02)	0.319	–	–

Sex, male	3.00 (1.08 – 8.34)	0.035	2.57 (0.88 – 7.52)	0.084
Weight loss	1.06 (0.99 – 1.14)	0.060	–	–
Δ BMI	1.05 (0.94 – 1.17)	0.381	–	–
Δ waist circumference	0.99 (0.95 – 1.04)	0.903	–	–
Δ Total visceral fat area	0.99 (0.99 – 1.01)	0.635	–	–
Δ Lean mass	1.03 (0.97 – 1.09)	0.306	–	–
Sclerostin	1.01 (1.00 – 1.02)	0.013	1.01 (1.00 – 1.02)	0.024

Statistically significant *p*-values are in bold.

OR: odds ratio; CI: confidence interval; BMI: body mass index; HOMA: homeostatic model assessment for insulin resistance (IR) and peripheral insulin sensitivity (S).

Supplementary Figure 1

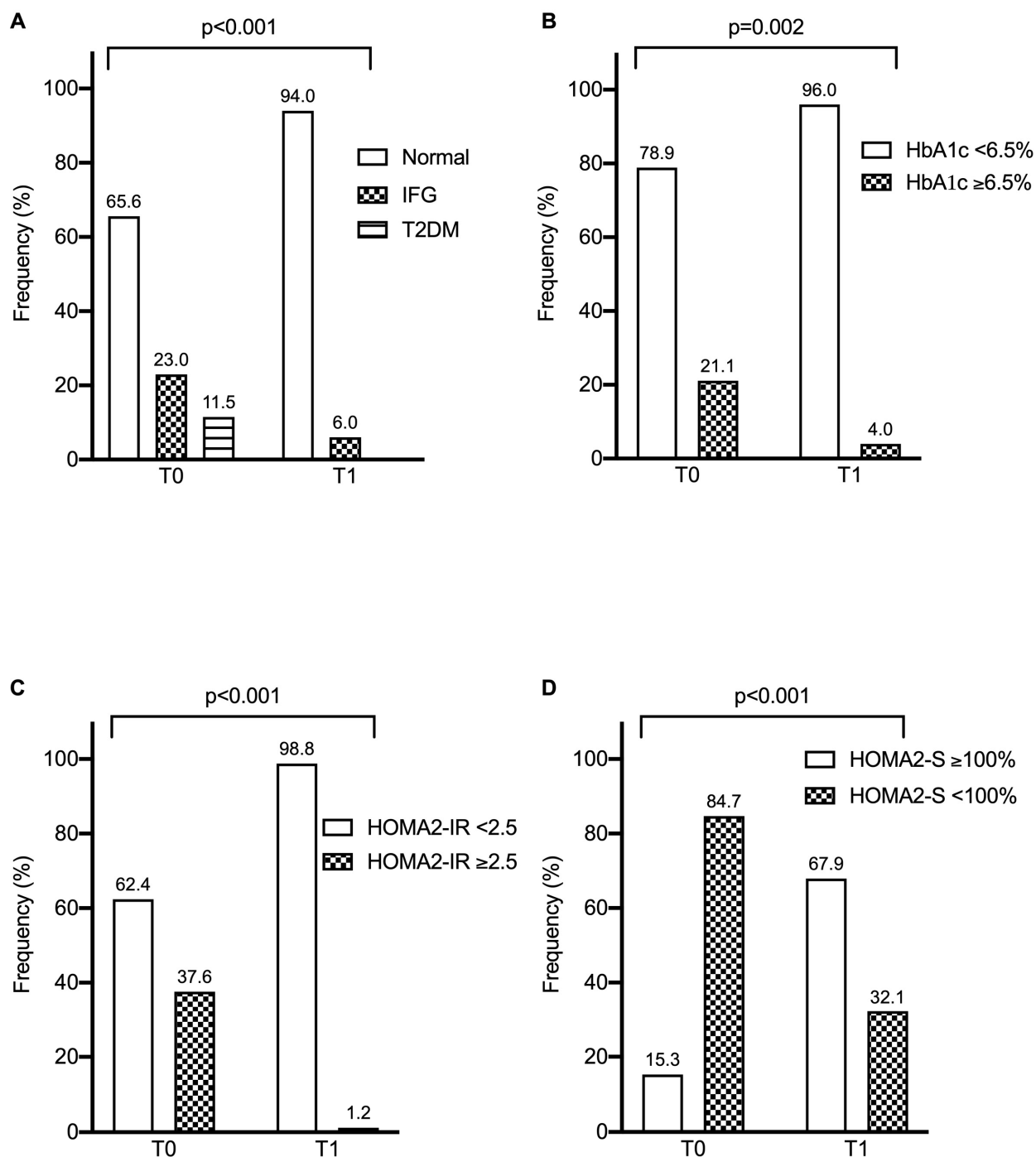


Figure S1. Sleeve gastrectomy significantly improves glycemic profile. Sleeve gastrectomy determine a general improvement of glycemic profile with regression of type 2 diabetes mellitus (T2DM) e reduction of patients with impaired fasting glucose (IFG) (A). Accordingly, there was an improvement of serum levels of glycated hemoglobin (B), and homeostatic model assessment (HOMA) for insulin resistance (IR) (C) and peripheral insulin sensitivity (%S) (D).

