

Table S1 Baseline characteristics of included and excluded participants.

Variables	Included(n=52)	Excluded(n=56)	P
Age, in years	31.25±7.48	30.25±5.93	0.441
Sex (M/F), %	13/39	12/44	0.820
BMI, kg/m ²	37.69±4.82	37.75±5.51	0.950
Systolic blood pressure, mmHg	133(125,149.5)	135(125.25,146.75)	0.883
Diastolic blood pressure, mmHg	83.5(75.25,90.75)	80(77,90.75)	0.721
Hypertension, %	40%(21/52)	45%(25/56)	0.700
TC, mmol/L	4.73±0.78	5.00±1.03	0.141
TG, mmol/L	1.96(1.29,2.68)	1.89(1.31,2.98)	0.822
HDL, mmol/L	1.25±0.21	1.29±0.22	0.401
LDL, mmol/L	2.98±0.68	3.08±0.76	0.409
Hyperlipidemia, %	65.3% (34/52)	11.5%(34/56)	0.692
HbA1c, %	5.6 (5.4, 6.38)	5.65(5.4,6.35)	0.690
Glucose, mmol/L	5.61(4.87, 6.38)	5.59(5.18,6.26)	0.422
Diabetes, %	25% (13/52)	27% (15/56)	1.000
MS, %	46.1% (24/52)	54% (30/56)	0.564
TFA, cm ²	632.87±149.52	603.81±128.30	0.280
VFA, cm ²	230.38±77.60	217.94±78.59	0.410
SFA, cm ²	402.49±120.62	385.87±98.12	0.432
LF, %	20.58±7.41	21.32±9.64	0.659
PF, %	20.45 (16.15, 30.13)	21(17.78, 25.05)	0.875
SMI, cm ² /m ²	64.72±10.96	63.24±13.81	0.635
PMFC, %	7.9 (6.02, 10.32)	7.25(5.75, 8.8)	0.245

Note: Descriptive statistics were expressed as mean±standard deviation or median (interquartilerange).

Abbreviations: BMI, body mass index; TC, total cholesterol; TG, triglyceride; HDL, high-density lipoprotein; LDL, low-density lipoprotein; MS; metabolic syndrome; TFA, total fat area; VFA, visceral fat area; SFA, subcutaneous fat area; SMI, skeletal muscle index; LF, liver fat; PF, pancreas fat; PMFC, postvertebral muscle fat content.

Table S2 Consistency assessment based on QCT body composition measurement

	ICC	95%CI
TFA	0.997	0.994–0.999
VFA	0.989	0.910–0.997
SFA	0.989	0.957–0.996
SMA	0.962	0.906–0.985
LF	0.927	0.819–0.971
PF	0.913	0.783–0.965
PMFC	0.923	0.810–0.969

Abbreviations: QCT, quantitative computed tomography; ICC, intraclass correlation coefficient; CI, confidence interval; TFA, total fat area; VFA, visceral fat area; SFA, subcutaneous fat area; SMA, skeletal muscle area; LF, liver fat; PF, pancreas fat; PMFC, postvertebral muscle fat content.

Table S3 Correlations between BMI, body composition, and Laboratory parameters in obese patients with MS before LSG

		TC	TG	HDL	LDL	HbA1c	Glucose
BMI	Correlation coefficient	0.137	0.127	-0.164	0.13	-0.078	-0.05
	p value	0.525	0.554	0.445	0.546	0.717	0.815
TFA	Correlation coefficient	0.108	0.143	0.02	.406	-0.04	0.18
	p value	0.616	0.504	0.924	0.049	0.853	0.399
VFA	Correlation coefficient	0.177	0.366	-0.136	0.12	-0.012	-0.08
	p value	0.408	0.079	0.527	0.576	0.955	0.712
SFA	Correlation coefficient	-0.14	0.009	-0.051	0.172	0.077	.422
	p value	0.514	0.968	0.815	0.421	0.722	0.04
SMI	Correlation coefficient	-0.016	0.23	-.488	0.061	-0.082	-0.354
	p value	0.941	0.279	0.016	0.778	0.702	0.09
LF	Correlation coefficient	0.234	0.16	0.09	0.232	-0.025	.415
	p value	0.271	0.455	0.677	0.275	0.907	0.044
PF	Correlation coefficient	0.134	0.097	-.542	-0.017	-0.301	-0.258
	p value	0.534	0.654	0.006	0.936	0.154	0.224
PMFC	Correlation coefficient	0.159	-0.336	0.216	0.25	-0.347	-0.054
	p value	0.459	0.108	0.31	0.239	0.096	0.802

Notes: Bolded numbers indicate statistical significance.

Abbreviations: LSG, laparoscopic sleeve gastrectomy; MS, metabolic syndrome; TC, total cholesterol; TG, triglyceride; HDL, high-density lipoprotein; LDL, low-density lipoprotein; MS; metabolic syndrome; TFA, total fat area; VFA, visceral fat area; SFA, subcutaneous fat area; SMI, skeletal muscle index; LF, liver fat; PF, pancreas fat; PMFC, postvertebral muscle fat content.

Table S4 Correlations between BMI, body composition, and laboratory parameters in obese patients without MS before LSG

		TC	TG	HDL	LDL	HbA1c	Glucose
BMI	Correlation coefficient	-0.296	-0.343	-0.151	-0.16	-0.175	-0.238
	p value	0.126	0.074	0.442	0.415	0.372	0.223
TFA	Correlation coefficient	-0.351	-0.422	-0.129	-0.252	0.049	-0.234
	p value	0.067	0.025	0.514	0.197	0.804	0.231
VFA	Correlation coefficient	-0.038	-0.126	-0.325	-0.005	-0.015	-0.196
	p value	0.848	0.522	0.091	0.979	0.939	0.317
SFA	Correlation coefficient	-0.411	-0.423	0.05	-0.312	-0.01	-0.22
	p value	0.03	0.025	0.801	0.106	0.958	0.26
SMI	Correlation coefficient	-0.166	0.076	-0.328	-0.009	-0.165	-0.283
	p value	0.399	0.702	0.088	0.965	0.402	0.145
LF	Correlation coefficient	0.079	-0.12	-0.267	0.175	-0.195	-0.267
	p value	0.688	0.544	0.17	0.372	0.321	0.17
PF	Correlation coefficient	0.119	-0.074	-0.048	0.073	0.284	-0.095
	p value	0.548	0.708	0.808	0.713	0.144	0.631
PMFC	Correlation coefficient	-0.106	-0.221	0.08	-0.188	0.273	0.091
	p value	0.592	0.258	0.684	0.337	0.16	0.645

Notes: Bolded numbers indicate statistical significance.

Abbreviations: LSG, laparoscopic sleeve gastrectomy; MS, metabolic syndrome; TC, total cholesterol; TG, triglyceride; HDL, high-density lipoprotein; LDL, low-density lipoprotein; MS; metabolic syndrome; TFA, total fat area; VFA, visceral fat area; SFA, subcutaneous fat area; SMI, skeletal muscle index; LF, liver fat; PF, pancreas fat; PMFC, postvertebral muscle fat content.

Table S5 Correlation analysis of BMI and body composition change rates with laboratory indicators following LSG in MS patients

		ΔTC	ΔTG	ΔHDL	ΔLDL	ΔHbA1c	ΔGlucose
ΔBMI	Correlation coefficient	-0.282	0.012	-0.227	-0.087	-0.24	0.203
	p value	0.182	0.955	0.286	0.686	0.258	0.34
ΔTFA	Correlation coefficient	-0.119	-0.253	0.15	0.073	-0.08	0.272
	p value	0.579	0.233	0.485	0.734	0.712	0.198
ΔVFA	Correlation coefficient	-0.021	0.005	-0.09	0.18	0.03	0.309
	p value	0.923	0.981	0.674	0.4	0.888	0.142
ΔSFA	Correlation coefficient	-0.191	-0.357	0.226	0.02	-0.212	0.298
	p value	0.371	0.087	0.288	0.926	0.32	0.157
ΔSMI	Correlation coefficient	-0.174	0.065	0.048	-0.058	0.056	-0.003
	p value	0.416	0.762	0.824	0.787	0.795	0.99
ΔLF	Correlation coefficient	0.11	-0.098	0.368	0.151	0.025	.414
	p value	0.61	0.648	0.077	0.48	0.907	0.044
ΔPF	Correlation coefficient	-0.342	-0.17	-0.086	-0.402	0.361	0.233
	p value	0.102	0.426	0.689	0.052	0.083	0.273
ΔPMFC	Correlation coefficient	0.383	-0.033	0.28	0.226	-0.284	-0.113
	p value	0.064	0.878	0.185	0.288	0.179	0.599

Notes: Bolded numbers indicate statistical significance.

Abbreviations: LSG, laparoscopic sleeve gastrectomy; MS; metabolic syndrome; TC, total cholesterol; TG, triglyceride; HDL, high-density lipoprotein; LDL, low-density lipoprotein; TFA, total fat area; VFA, visceral fat area; SFA, subcutaneous fat area; SMI, skeletal muscle index; LF, liver fat; PF, pancreas fat; PMFC, postvertebral muscle fat content. Δ Body composition = (preoperative Body composition - postoperative Body composition) / preoperative Body composition; Δ BMI = (preoperative BMI - postoperative BMI) / preoperative BMI; Δ Laboratory indicators = (preoperative Laboratory indicators - postoperative Laboratory indicators) / preoperative Laboratory indicators.

Table S6 Correlation analysis of BMI and body composition change rates with laboratory indicators following LSG in Non-MS patients

		Δ TC	Δ TG	Δ HDL	Δ LDL	Δ HbA1c	Δ Glucose
Δ BMI	Correlation coefficient	0.241	.427	-0.024	.480	-0.157	0.205
	p value	0.216	0.023	0.903	0.01	0.426	0.295
Δ TFA	Correlation coefficient	-0.314	0.119	-0.306	-0.038	0.05	0.132
	p value	0.103	0.545	0.113	0.847	0.801	0.502
Δ VFA	Correlation coefficient	-0.344	-0.122	-0.25	-0.122	-0.079	-0.055
	p value	0.073	0.538	0.2	0.538	0.691	0.782
Δ SFA	Correlation coefficient	-0.183	0.296	-0.222	0.071	0.081	0.223
	p value	0.35	0.126	0.256	0.721	0.683	0.253
Δ SMI	Correlation coefficient	-0.265	-0.106	-0.074	-0.17	0.259	-0.308
	p value	0.172	0.591	0.707	0.388	0.184	0.111
Δ LF	Correlation coefficient	0.182	0.208	0.067	0.22	0.26	0.076
	p value	0.355	0.288	0.736	0.261	0.182	0.7
Δ PF	Correlation coefficient	-0.061	0.135	-0.078	-0.104	0.242	0.309
	p value	0.757	0.493	0.692	0.598	0.215	0.109
Δ PMFC	Correlation coefficient	-0.24	-0.355	0.367	-0.182	0.304	-0.281
	p value	0.218	0.064	0.055	0.353	0.116	0.147

Notes: Bolded numbers indicate statistical significance.

Abbreviations:LSG, laparoscopic sleeve gastrectomy; MS; metabolic syndrome; TC, total cholesterol; TG, triglyceride; HDL, high-density lipoprotein; LDL, low-density lipoprotein; TFA, total fat area; VFA, visceral fat area;SFA, subcutaneous fat area; SMI, skeletal muscle index; LF, liver fat; PF, pancreas fat; PMFC, postvertebral muscle fat content. Δ Body composition = (preoperative Body composition– postoperative Body composition) / preoperative Body composition; Δ BMI = (preoperative BMI– postoperative BMI) / preoperative BMI; Δ Laboratory indicators = (preoperative Laboratory indicators– postoperative Laboratory indicators) / preoperative Laboratory indicators.