

Appendix 1: Full search strategy

1. (non-alcoholic fatty liver disease* or nonalcoholic fatty liver disease*).tw. or exp non-alcoholic fatty liver disease/ or (NAFLD or NASH* or non-alcoholic steato* or nonalcoholic steato* or hepat* steato* or liver steato*).tw.
2. exp bariatric surgery/ or gastric bypass*.tw. or (bariatric* or gastroplast* or ((gastric or jejunoileal or jejuno-ileal or ileojejunal or ileo jejunal or gastroileal or roux-en-y) adj2 bypass*) or gastrojejunostom* or intestinal bypass* or lipectomy or lipectomy* or lipoplasty or lipoplast* or lipolysis or lipolysis or liposuction or liposuction* or gastric band* or biliopancreatic bypass or biliopancreatic diversion* or bilio-pancreatic diversion or gastrectomy or gastrectom* or biliopancreatic diversion or duodenal switch or gastric plication).tw. [mP=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
3. exp animals/ not humans.sh
4. (Endoscopic sleeve gastroplasty or ESG or Bariatric endoscopy or Endobariatrics).tw.
5. exp gastric balloon/ or (gastric balloon* or intragastric balloon* or gastric bubble or intragastric bubble).tw.
6. (Endoscopic Mucosal Resect* or Resurfacing or DMR).tw. or exp endoscopic mucosal resection/
7. (EBMT or endoscopic bariatric metabolic therap*).tw.
8. ((endoscopy/ or exp endoscopy, digestive system/) and exp gastroplasty/) or ((bariatric* or sleeve* or gastroplast* or plication* or metabolic or volume reduction or malabsorptive) adj3 endoscop*).tw. or ((gastric or intragastric) adj2 balloon*).tw. or (pose and (gastroplast* or gastric) and endoscop*).tw. or (endosleeve* or orbera or (reshape adj3 balloon) or obalon or pose procedure or primary obesity surgery endoluminal or aspiration therap* or aspireassist or aspire assist).tw.
9. 4 or 5 or 6 or 7 or 8
10. 2 or 9
11. 1 and 10
12. limit 11 to English
13. 12 not 3
14. limit 13 to (abstracts and structured abstracts and "review articles")
15. 13 not 14

Table S1 Summary of histopathological outcomes for restrictive procedures versus foregut bypass

Grade	Restrictive procedures					Foregut bypass					Subgroup difference
	No. of studies	OR (95% CI)	Cochran Q	I ²	P value	No. of studies	OR (95% CI)	Cochran Q	I ²	P value	
F0	4	5.77 (1.95–17.08)	0.63	0.00%	<0.01	10	5.73 (3.43–9.58)	0.52	0.00%	0.01	0.99
F1	4	1.22 (0.34–4.43)	0.28	21.60%	0.65	10	0.32 (0.16–0.67)	0.16	30.70%	<0.01	0.01*
F2	4	0.35 (0.15–0.85)	0.62	0.00%	0.03	9	0.27 (0.13–0.55)	0.86	0.00%	<0.01	0.51
F3	4	0.26 (0.02–4.26)	0.22	34.60%	0.18	9	0.51 (0.12–2.10)	0.61	0.00%	0.23	0.40
F4	4	0.66 (0.01–73.11)	0.7	0.00%	0.46	8	1.00 (0.40–2.50)	0.92	0.00%	1.00	0.40
S0	4	14.42 (1.35–153.57)	0.03	65.60%	0.04	10	75.40 (31.17–182.41)	0.37	8.30%	<0.01	0.05*
S1	4	1.82 (0.18–18.39)	<0.01	82.30%	0.47	10	0.30 (0.09–1.01)	<0.01	75.60%	0.05	0.05*
S2	4	0.26 (0.15–0.46)	0.88	0.00%	<0.01	10	0.08 (0.05–0.13)	0.98	0.00%	<0.01	< 0.001*
S3	4	0.07 (0.00–2.37)	0.16	45.90%	0.08	10	0.05 (0.02–0.12)	0.64	0.00%	<0.01	0.65
I0	3	6.26 (1.27–30.81)	0.40	0.00%	0.04	8	15.99 (5.65–45.27)	0.25	22.10%	<0.01	0.10
I1	3	0.48 (0.01–31.54)	0.02	74.40%	0.53	8	0.35 (0.07–1.63)	<0.01	72.90%	0.15	0.78
I2	3	0.24 (0.04–1.63)	0.57	0.00%	0.09	7	0.13 [0.07–0.25)	0.91	0.00%	<0.01	0.23
I3	2	0.05 (0.00–0.83)	–	–	0.04	6	0.14 (0.05–0.41)	0.91	0.00%	0.02	0.46
B0	2	27.44 (0.00–70.13)	0.04	75.60%	0.27	6	17.17 (6.25–47.15)	0.54	0.00%	<0.01	0.77
B1	2	0.33 (0.00–5659.29)	0.07	68.60%	0.38	6	0.21 (0.03–1.27)	<0.01	73.00%	0.08	0.66
B2	2	0.04 (0.00–25.65)	0.56	0.00%	0.10	6	0.09 (0.03–0.32)	0.72	0.00%	<0.01	0.26

*, P value ≤ 0.05 denotes statistical significance. F0–F4 represents stage 0–4 fibrosis; S0–S3 represents grade 0–3 steatosis; I0–I3 represents grade 0–3 lobular inflammation; B0–B2 represents grade 0–2 ballooning. OR, odds ratio; CI, confidence interval.

Table S2 Comparison of primary endpoints between sleeve gastrectomy versus Roux-en-Y bypass

Grade	Sleeve gastrectomy					Roux-en-Y bypass					Subgroup difference
	No. of studies	OR (95% CI)	Cochran Q	I ²	P value	No. of studies	OR (95% CI)	Cochran Q	I ²	P value	
F0/F1	2	6.16 (0.16–231.54)	0.72	0.00%	0.10	10	3.23 (1.80–5.79)	0.81	0.00%	<0.01	0.09
S0	2	10.78 (0.00–2,484,847,752.43)	0.02	81.70%	0.36	10	75.40 (31.17–182.41)	0.37	8.30%	<0.01	0.21
I0	2	10.08 (0.01–11,138.80)	0.37	0.00%	0.15	8	15.99 (5.65–45.27)	0.25	22.10%	<0.01	0.51
B0	NA	–	–	–	–	6	17.17 (6.25–47.15)	0.54	0.00%	<0.01	NA

*, P value ≤0.05 denotes statistical significance. F0/1 represents reversal of clinically significant fibrosis; S0, I0, and B0 represents resolution of steatosis, lobular inflammation, and ballooning respectively. N/A, not available; OR, odds ratio; CI, confidence interval.

Table S3 Summary of metabolic parameters and liver enzymes for sleeve gastrectomy versus Roux-en-Y bypass

Outcomes	Sleeve gastrectomy					Roux-en-Y bypass					Subgroup difference
	No. of studies	OR (95% CI)	Cochran Q	I ²	P value	No. of studies	OR (95% CI)	Cochran Q	I ²	P value	
AST	12	-8.56 (14.27 to -2.86)	<0.01	84.40%	<0.01	15	-4.49 (-8.13 to -0.85)	<0.01	90.40%	0.02	0.19
ALT	12	-20.26 (-28.34 to -12.18)	<0.01	87.20%	<0.01	11	-9.26 (-15.91 to -2.60)	<0.01	94.10%	0.01	0.02*
GGT	7	-11.74 (-19.20 to -4.28)	<0.01	72.30%	<0.01	6	-19.56 (-28.66 to -10.46)	0.03	58.40%	<0.01	0.09
ALP	6	-6.09 (-9.06 to -3.11)	0.73	0.00%	<0.01	8	-8.42 (-24.68 to 7.83)	<0.01	93.10%	0.26	0.74
BMI	8	-12.10 (-13.69 to -10.50)	0.03	56.20%	<0.01	16	-16.66 (-19.01 to -14.31)	<0.01	95.80%	<0.01	<0.001*
HbA1c	5	-0.98 (-1.54 to -0.43)	<0.01	80.90%	<0.01	2	-0.70 (-0.96 to -0.44)	0.75	0.00%	0.02	0.15
HDL	8	7.83 (4.42 to 11.24)	<0.01	77.10%	<0.01	9	9.25 (4.57 to 13.93)	<0.01	85.40%	<0.01	0.57
LDL	8	-4.57 (-13.01 to 3.86)	<0.01	67.90%	0.24	7	-16.77 (-26.51 to -7.02)	0.04	53.60%	<0.01	0.02*

*, P value ≤0.05 denotes statistical significance. OR, odds ratio; CI, confidence interval; BMI, body mass index; HbA1c, haemoglobin A1C; HDL, high-density lipoprotein; LDL, low-density lipoprotein; AST, aspartate aminotransferase; ALT, alanine transaminase; GGT, gamma-glutamyl transpeptidase; ALP, alkaline phosphatase.