APPENDIX A. DETAILED SEARCH STRATEGY

Initial Strategy: (gastric artery OR bariatric) AND (embolization) AND (weight or BMI)

PubMed/MEDLINE. ((("stomach" [MeSH Terms] OR "stomach" [All Fields] OR "gastric" [All Fields]) AND ("arteries" [MeSH Terms] OR "arteries" [All Fields] OR "artery" [All Fields])) OR bariatric [All Fields]) AND ("embolization, therapeutic" [MeSH Terms] OR ("embolization" [All Fields] AND "therapeutic" [All Fields]) OR "therapeutic embolization" [All Fields] OR "embolization" [All Fields])

Additional search for "weight" and "BMI":

((("stomach" [MeSH Terms] OR "stomach" [All Fields] OR "gastric" [All Fields]) AND ("arteries" [MeSH Terms] OR "arteries" [All Fields] OR "artery" [All Fields])) OR bariatric [All Fields]) AND ("embolization, therapeutic" [MeSH Terms] OR ("embolization" [All Fields] AND "therapeutic" [All Fields]) OR "therapeutic embolization" [All Fields] OR "embolization" [All Fields]) AND (("weights and measures" [MeSH Terms] OR ("weights" [All Fields] AND "measures" [All Fields]) OR "weights and measures" [All Fields] OR "weight" [All Fields] OR "body weight" [MeSH Terms] OR ("body" [All Fields] AND "weight" [All Fields]) OR "body weight" [All Fields]) OR BMI [All Fields])

Embase. ('gastric artery'/exp OR 'gastric artery' OR (gastric AND ('artery'/exp OR artery)) OR bariatric) AND ('embolization'/exp OR embolization)

Scopus. TITLE-ABS-KEY ((gastric AND artery OR bariatric) AND (embolization))

Web of Science. TOPIC: ((gastric artery OR bariatric) AND (embolization)); Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC.

Table E1. Summary of Study Details

First Author (Reference)	Study Details
Obesity Clinical Trials	
Weiss (18,21)	The preliminary report (18) included data on 5 participants and assessed the safety and feasibility of bariatric embolization with a new device, Embosphere Microspheres (Merit Medical Systems, Inc, South Jordan, Utah). The second report (21) included 20 participants, of whom 15 had detailed 12-month follow-up data. Inclusion criteria consisted of relevant history (no GI surgery, radiation, or embolization); adequate liver and kidney function; lack of chronic comorbidities, including autoimmune disorders and peptic ulcer disease (positive stool blood, active *Helicobacter pylori* infection, daily nonsteroidal anti-inflammatory drug use, and smoking); and suitability for the therapy protocol (considering risk of anesthesia using American Society of Anesthesiologists class IV or V, understanding of and willingness to participate in the study, and residence with 25 miles of the institution). Participants underwent gastric emptying studies (evaluating for slowing of gastric emptying) and three-dimensional CT angiography (assessing for vascular variations) and upper GI endoscopy. Patients weighing $>$ 181 kg were excluded. Embolization was performed in the LGA with (in 3 participants) or without (in 2 participants) gastric artery embolization. The decision to perform embolization of the fundus was based on fundal perfusion defect on arterial phased cone-beam CT obtained before embolization as well as procedural factors. Appropriate distribution of embolization and microspheres was confirmed at the end of the procedure.
Elens (20)	Twenty-six overweight patients (BMI $>$ 25 and $<$ 35 kg/m^2) for whom dietary measures had failed were screened to undergo LGA embolization for weight control. Patients with history of gastric ulcers or polyps; abdominal radiation or embolization; daily nonsteroidal anti-inflammatory drug, steroid, or anticoagulant use; or psychiatric disorder were excluded. Patients who were pregnant; patients who had chronic medical conditions, including aortic aneurysm or dissection, renal insufficiency, cirrhosis, or portal hypertension; and patients with history of allergy to iodinated contrast media were excluded. Ten patients declined endovascular treatment, and 16 patients underwent bariatric embolization. The primary outcome of interest was weight loss at 3, 6, and 12 months. Secondary outcomes included satisfaction and appetite assessments as well as safety measures.
Pirlet (23)	Patients $\geq$ 18 years old with BMI $>$ 40 and a long history of obesity with multiple attempts at weight control were included. No patient had a history of bariatric intervention/surgery, and none of the patients had a diagnosis of cancer or a psychiatric condition affecting food intake. Seven patients were included and underwent radial approach embolization by an interventional cardiologist. Outcomes of interest were technical feasibility (successful embolization defined as distal interruption of flow), safety (lack of complications, including dissection or abdominal symptoms), and weight loss following the procedure (after 2, 6, and 12 months).
Bai (14)	Stringent inclusion criteria were patients 18–65 years old with no history of GI surgery or peptic ulcer disease, no hepatic or renal dysfunction, no use of nonsteroidal anti-inflammatory drugs, no history of smoking, no major cardiovascular or neoplastic disorder, and at least 1 year of follow-up. Patients with psychiatric conditions and patients who were pregnant or planned to become pregnant within the year were also excluded. The primary endpoint was safety of LGA embolization for the treatment of obesity.
Syed (17)	The primary endpoint of this new device investigational study was safety of LGA embolization with 300–500 μm Bead Block particles (Biocompatibles, Farnham, United Kingdom) for treatment of morbid obesity; efficacy, satiety, and quality-of-life measures were secondary endpoints. Similar to the study by Weiss et al (18), Syed et al (17) had US Food and Drug Administration exemption to include 5 patients. However, 1 patient had an anatomic variation on CT angiography and was excluded from the final sample. The study included patients $>$ 22 years old with no prior surgeries, embolizations, or comorbid conditions related to the GI system, liver, kidneys, or cardiovascular system. The study excluded patients with certain psychiatric disorders and patients with contraindications to monitored anesthesia. One included patient had diabetes. All women in the sample used 2 methods of contraception during the study period. Similar to the study by Weiss et al (18), Syed et al (17) reported the amount of radiation exposure (approximate average entrance skin dose).
Kipshidze (16)	The primary endpoint was safety and efficacy of LGA embolization. Limited information on the inclusion and exclusion criteria is available.
GI bleeding studies	
Takahashi (22)	In this retrospective evaluation of 89 patients who underwent LGA embolization for gastric bleeding, 61 were excluded because of incomplete medical history, unavailable imaging, interval surgery, or active malignancy. Twelve additional patients with BMI $<$ 25 kg/m^2 were excluded. All participants underwent CT (abdomen and pelvis) before embolization and at follow-up. The primary purpose of the study was to evaluate the effect of LGA embolization on body composition indices related to total body fat, subcutaneous fat, visceral fat, intramuscular fat, and skeletal muscle.

continued

Table E1. Summary of Study Details *(continued)*

First Author (Reference)	Study Details
Kim (15)	This retrospective study included 21 patients who underwent LGA embolization for GI bleeding and had available weights before and after embolization. In addition to LGA, embolization was performed in the splenic artery in 2 patients and gastroepiploic artery in 1 patient. Embolic status was temporary in 11 patients and permanent in 10 patients.
Gunn (9)	Retrospective evaluation was performed of patients who underwent embolization of any of the celiac trunk branches for GI bleeding and had at least 3 weight measurements (before procedure, early after procedure, late after procedure). Patients who underwent embolization of a celiac trunk branch other than the LGA served as controls for comparison. The study did not exclude patients with a history of malignancy or other chronic conditions, including congestive heart failure and chronic kidney disease. However, independent analyses were performed according to presence (or absence) of cancer. Of 19 patients, 11 had a history of cancer, and 4 patients were receiving chemotherapy during the study period.

BMI = body mass index; GI = gastrointestinal; LGA = left gastric artery.

Table E2. Sensitivity Analysis: Evaluating Susceptibility to Change of Pooled Weight Loss

Studies Excluded (Reference)	Mean Pooled Weight Loss, kg	95% CI Lower Limit	95% CI Upper Limit	SE	*Z*	*P*
Weiss (21)	10.22	6.40	14.04	1.95	5.24	< .001
Elens (20)	10.28	6.20	14.37	2.08	4.93	< .001
Pirlet (23)	8.85	6.12	11.58	1.39	6.36	< .001
Bai (14)	8.87	6.13	11.61	1.40	6.34	< .001
Syed (17)	9.23	6.06	12.39	1.62	5.71	< .001
Kipshidze (16)	8.24	6.14	10.34	1.07	7.69	< .001
Studies with follow-up < 12 mo	12.55	21.13	3.98	4.37	2.87	.004

CI = confidence interval.

Table E3. Evaluating Risk of Bias of Included Studies Using the Minors Instrument (27)

First Author (Reference)	MINORS Criteria*								Total Score†
	A	B	C	D	E	F	G	H	
Weiss (18,21)	2	2	2	2	2	2	1	1	14
Elens (20)	2	2	2	2	2	1	1	0	12
Pirlet (23)	1	1	2	2	2	2	0	0	10
Bai (14)	2	1	2	2	2	1	0	1	11
Syed (17)	2	2	2	2	2	1	1	1	13
Kipshidze (16)	2	0	2	2	2	2	2	0	12

MINORS = Methodological Index for Non-Randomized Studies.
*Criteria are as follows: A = clearly stated aim; B = inclusion of consecutive patients; C = prospective data collection; D = endpoint appropriate to aim; E = unbiased assessment of endpoint; F = follow-up period appropriate to aim; G = loss to follow-up < 5%; H = prospective calculation of sample size.
†Items are scored as follows: 0 = not reported; 1 = reported but inadequate; 2 = reported and adequate. The global ideal score is 16.