

Primary Care Treatment of Patients Following Bariatric Surgery in 2020

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Bariatric surgery is commonly performed to achieve otherwise refractory weight loss. Outcomes following these procedures depend on the quality of clinical care received after the procedure,¹ although many patients who undergo bariatric surgery do not entirely adhere to the prescribed follow-up regimen. A 2011² study showed that only 7% of the 242 patients had office follow-up 10 years after Roux-en-Y gastric bypass surgery (RYGB). Primary care physicians (PCPs) should be aware of the potential adverse outcomes after bariatric surgery, including risk of weight regain, surgical complications, and nutritional deficiencies.

For patients who have undergone bariatric surgery, the assessment during an annual visit should include weight loss/gain trend, vitamin/mineral supplementation, exercise, improvement/relapse of comorbidity, and yearly laboratory evaluation (**Box**). When treating these patients, clinicians should understand the expected results of the bariatric procedure. Most of the primary bariatric procedures currently performed in the US are either sleeve gastrectomy (SG) or RYGB.³ Most patients reach their maximal weight loss 12 to 24 months after bariatric surgery, which will be approximately one-third of their initial total body weight.^{4,5} Some weight regain can occur; significant weight regain, defined as regaining approximately 15% of the total weight lost after surgery, can occur in up to 50% of patients within 5 years of the initial bariatric operation.⁵ Lifestyle counseling is the mainstay of treatment for mild to moderate weight regain after bariatric surgery. Because of the significantly reduced gastric capacity, patients should eat 3 meals and up to 2 snacks per day. The diet should be balanced and should include 80 to 100 g of protein to prevent protein deficiency.⁶ Weight loss medications, endoscopic treatment (eg, purse-string transoral outlet reduction to reduce the size of gastrojejunostomy anastomosis size), and revisional bariatric surgery (eg, limb distalization to increase the malabsorption) have been proposed for managing significant weight regain. However, high-quality data regarding the long-term efficacy of these treatments are lacking.

The use of adjustable gastric banding has decreased substantially in recent years because of its high complication rate and poor long-term weight loss.³ Patients who have had gastric banding procedures have high likelihood of developing nausea, vomiting, or significant weight regain. Band revision/removal or conversion to SG/RYGB may be indicated to relieve these symptoms and improve weight loss.

During the assessment, PCPs may recognize potential medical complications related to bariatric surgery, such as gastroesophageal reflux disease or dumping syndrome, defined as colicky abdominal pain, diarrhea, nausea, diaphoresis, and tachycardia after eating. The prevalence, presentation, diagnosis, and management of common complications related to bariatric surgery are shown in

Box. Assessments for Patients After Bariatric Surgery

Assessments for every clinic visit

- Weight loss
- Level of exercise
- Vitamin and mineral supplementation being taken
- Comorbidity assessment (type 2 diabetes, hypertension, sleep apnea, joint pain)
- Potential bariatric surgery complications

Annual laboratory assessments

- Complete blood cell count
- Complete metabolic panel
- Vitamin B₁
- Hemoglobin A_{1c}
- Thyroid-stimulating hormone
- Lipid evaluation based on risks
- Folate, iron studies, 25-hydroxyvitamin D, and zinc for Roux-en-Y gastric bypass surgery
- Other vitamin laboratory measurement if deficiency is suspected

Table 1. Referral back to bariatric surgeons should be made for patients with significant weight regain, surgical complications, or complications requiring surgical management. Any time a postsurgical patient, especially a patient who underwent gastric bypass, experiences abdominal pain or pain related to eating, prompt referral to a bariatric surgeon is imperative to mitigate the risks of rare catastrophic complications of bariatric surgery. PCPs should also consider the increased incidence of alcohol and drug use disorder after bariatric surgery likely caused by the switch from eating to drinking/drugs as a coping strategy to deal with life stresses.⁷

Despite excessive calorie intake, patients with obesity have high rates of micronutrient deficiencies before surgery. Without proper supplementation, many patients who have undergone bariatric procedures develop new deficiencies even years after the operation was performed. Reasons for some of these deficiencies are related to the altered surgical anatomy after gastric bypass surgery (eg, B₁₂, calcium, iron), but also to decreased nutrient intake after surgery and rapid weight loss in general (eg, thiamine). In patients who have undergone gastric bypass surgery, the distal stomach and duodenum are bypassed, limiting the breakdown of vitamin B₁₂ and its subsequent binding with intrinsic factor, which can lead to pernicious anemia. All patients who have undergone bariatric surgery are advised to take vitamin supplementation for life, preferably 2 adult multivitamins plus minerals (containing iron, folic acid, and thiamine), elemental calcium, vitamin D, and vitamin B₁₂ (eTable in the [Supplement](#)).⁸ Among patients who have undergone SG surgery, there is a slight increase in the incidence of vitamin B₁, vitamin B₁₂, and calcium deficiency. The most common deficiencies after RYGB

Table 1. Prevalence, Presentation, Diagnosis, and Management of Common Bariatric Complications

Complication	Prevalence	Presentation	Diagnosis	Management
GERD	2%-30% (highest in patients who undergo SG)	Heartburn, chest pain, and nausea	Clinical diagnosis; EGD only indicated for severe symptoms	PPI therapy; conversion to RYGB for severe GERD refractory to PPI treatment
Dumping syndrome	40% (primarily in patients who undergo RYGB)	Colicky abdominal pain, diarrhea, nausea, and tachycardia	Clinical diagnosis; blood glucose level	Avoid food with high simple sugar content and replace with high-fiber, complex carbohydrate, and high-protein food; acarbose
Cholelithiasis	30%	Right upper quadrant pain if symptomatic	Abdominal ultrasonography	Cholecystectomy for symptomatic cholelithiasis (approximately 10% of patients may need cholecystectomy after bariatric surgery)
Marginal ulcer	1%-16% in patients who undergo RYGB	Upper abdominal pain, nausea, and vomiting	EGD	Smoking cessation; avoid NSAIDs; PPI and Carafate; endoscopic or surgical procedures for refractory cases
Stricture of anastomosis	1%-10% in patients who undergo RYGB	Dysphagia, nausea, and vomiting	Upper gastrointestinal tract series; EGD	Endoscopic dilation; surgical revision
Gastric banding complications	40%-50%	Nausea, vomiting, and food intolerance; port site infection; and abdominal pain	EGD; KUB radiographic imaging; computed tomographic imaging of abdomen	Band adjustment for tight band; band revision or removal for slippage, erosion, or severe GERD; conversion to RYGB or SG to prevent weight regain
Hypoglycemia	Up to one-third of patients who undergo RYGB have hypoglycemia, and most are asymptomatic; 11.6% are symptomatic	Confusion, heart palpitation, shakiness, and excessive sweating	Blood glucose and insulin level; continuous glucose monitoring	Dietary counseling; high-protein, high-fiber, and low-carbohydrate diet; acarbose; gastric bypass reversal reserved for patients with refractory symptoms
Bowel obstruction/internal hernia	1.5%-5% in patients who undergo RYGB	Nausea, vomiting, and abdominal pain	KUB radiographic imaging; computed tomographic imaging of abdomen	Low threshold for surgical exploration for unexplained abdominal pain after RYGB

Abbreviations: EGD, esophagogastroduodenoscopy; GERD, gastroesophageal reflux disease; KUB, kidney, ureter, and bladder; NSAID, nonsteroidal anti-inflammatory drug; PPI, proton pump inhibitor; RYGB, Roux-en-Y gastric bypass surgery; SG, sleeve gastrectomy.

involve iron, vitamin B₁₂, folate, calcium, and vitamin D. Micronutrient deficiency is relatively more common in patients who have undergone RYGB than in those who have undergone SG because RYGB

is a restrictive and malabsorptive procedure.⁹ The prevalence, presentation, diagnosis, and management of common vitamin/nutrient deficiencies are provided in the eTable in the Supplement.

ARTICLE INFORMATION

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