

Mechanisms Responsible for Excess Weight Loss after Bariatric Surgery

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Abstract

Obesity has increased alarmingly in the United States and is increasing in many countries of the world. Because obesity is an important risk factor for type 2 diabetes and other chronic diseases, it is important to develop approaches to counter the rapid increase in adiposity. One approach is bariatric surgery, the most successful clinical intervention known for treating obesity. Surgery can result in impressive weight loss and improvement of obesity-related comorbidities. Yet the mechanisms responsible for this remarkable effect of surgery remain controversial. It is now clear that caloric restriction, *per se*, does not explain all the reduction in stored fat mass after surgery. A number of gastrointestinal hormones, including glucagon-like peptide (GLP)-1, peptide YY, oxyntomodulin, GLP-2, glucose-dependent insulinotropic polypeptide, ghrelin, and others, can play roles in energy homeostasis and could be involved in bariatric-surgery-related weight loss and weight loss maintenance. Vagal innervation may play a role. In addition, there may be other yet-uncharacterized factors that could participate. This review discusses the possible roles of these hormonal mechanisms in various types of bariatric surgery to help elucidate some of the potential mechanisms at play in short-term and long-term post-bariatric surgery weight loss. Understanding such mechanisms could lead to new and efficacious means to control or even reduce the epidemic of obesity.

J Diabetes Sci Technol 2011;5(5):1263-1282

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Abbreviations: (AGB) adjustable gastric banding, (AUC) area under the curve, (BMI) body mass index, (BPD) biliopancreatic diversion, (CCK) cholecystokinin, (DPP) dipeptidyl peptidase, (EWL) excess weight loss, (GB) gastric bypass, (GIP) glucose-dependent insulinotropic polypeptide, (GLP) glucagon-like peptide, (JIB) jejuno ileal bypass, (LAGB) laparoscopic adjustable gastric banding, (OGTT) oral glucose tolerance test, (PYY) peptide YY, (RYGB) Roux-en-Y gastric bypass, (SG) sleeve gastrectomy, (VGB) vertical banded gastroplasty, (VIP) vasoactive intestinal peptide

Keywords: bariatric surgery, gut hormones, weight loss

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