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The effects of bariatric surgeries on type 2 diabetes mellitus¹ JIA LERD NG, ROBERTO ORTIZ, TYLER HUGHES, Texas A&M University, MICHEL ABOU GHANTOUS, OTHMANE BOUHALI, Texas A&M University at Qatar, ABDELILAH ARREDOUANI, Qatar Biomedical Research Institute, ROLAND ALLEN, Texas A&M University — We consider a scientific mystery which is of central importance in treating the most rapidly emerging national and global health threat: type 2 diabetes mellitus. The mystery involves a surprising effect of certain bariatric surgeries, and specifically Roux-en-Y gastric bypass (RYGB), a procedure which bypasses most of the stomach and upper intestine. An unanticipated result is that RYGB is usually found to contribute within only a few days to glucose homeostasis. This means the surgery can immediately cure patients even before they start losing weight. We are investigating this wondrous biochemical response with a quantitative model which includes the most important mechanisms. One of the major contributors is glucagon-like peptide 1 (GLP-1), an incretin whose concentration is found to increase by a large amount right after the RYGB surgical procedure. However, our results, in conjunction with the experimental and medical data, indicate that other substances must also contribute. If these substances can be definitively identified, it may be possible to replace the surgery with pharmaceuticals as the preferred treatment for type 2 diabetes.

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