

Nutritional Deficiency of Post-Bariatric Surgery Body Contouring Patients: What Every Plastic Surgeon Should Know

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Background: Bariatric surgery, particularly the Roux-en-Y gastric bypass, is currently the most effective method of sustainable weight loss for the morbidly obese patient population. Unfortunately, the nutritional adequacy of the post-operative diet has frequently been overlooked, and in the months to years that follow, many nutritional deficiencies have become apparent. Furthermore, once weight loss has reached a plateau, many patients become candidates for body contouring surgery and other aesthetic operations.

Methods: The aim of this review was to highlight the nutritional deficiencies of post-bariatric surgery patients as related to planned body contouring surgery. This review was prepared by an extensive search of the bariatric surgery literature.

Results: The current data indicate that many post-bariatric surgery patients have protein-calorie malnutrition as well as various vitamins and mineral deficiencies that may limit optimal health and healing.

Conclusions: It is essential that those plastic surgeons who treat post-bariatric surgery patients are aware of these nutritional deficiencies, which can be minimized by adhering to eating guidelines and supplemental prescriptions. Although there are many studies documenting relationships between malnutrition and poor wound healing, the optimal nutrient intake in the post-bariatric surgery state to promote wound healing is unknown. It is, however, clear that proteins, vitamin A, vitamin C, arginine, glutamine, zinc, and selenium have significant beneficial effects on wound healing and optimizing the immune system. (*Plast. Reconstr. Surg.* 122: 604, 2008.)

Obesity remains one of the leading health issues in today's society. It has reached epidemic proportions and causes approximately 300,000 deaths per year in the United States.¹ The Centers for Disease Control and Prevention confirms that poor diet and physical inactivity will likely become the leading causes of preventable, premature death in the United States unless obesity is reversed.² According to the National Health and Nutrition Examination Survey data from 2003 to 2004, 66.3 ± 1.1 percent of American adults were classified as overweight, 32.2 ± 1.2 percent were obese, and 4.8 ± 0.6 percent were morbidly obese.³ The correlating body mass index (kilograms per square meter) used to define overweight, obesity, and morbid obesity are 25.0 to 29.9, 30.0 to 39.9,

and over 40.0, respectively.^{4,5} Of all the available methods, weight loss surgery is the most effective long-term treatment for obesity because of its ability to provide sustained weight loss and amelioration of obesity-related comorbidities.^{6,7} Thus, the number of bariatric operations has risen each year by a factor of 5 from 1996 to 2003,⁸ with an estimated 177,600 bariatric operations in 2006 and a projected 205,000 procedures for 2007 according to the American Society for Metabolic and Bariatric Surgery.⁹ The popularity of gastric bypass surgery has led to an increasing population of post-bariatric surgery patients looking for body contouring surgery. According to statistics released by the American Society of Plastic Sur-

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