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Myths and misconceptions regarding bariatric surgery

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ABSTRACT

When properly indicated and performed by expert hands, the surgical management of obesity is the most effective means of achieving significant weight loss. Although the first report of a bariatric surgical procedure dates back to 1954, when Kremen described the jejunoileal bypass, it was not until 1967 when Mason first described the gastric bypass, based on his observations of weight loss after peptic ulcer surgery. Over the past 60 years, several bariatric surgical procedures have been developed. At present, the most commonly performed bariatric surgery in the U.S.A is the sleeve gastrectomy, whereas the Roux in Y gastric bypass is the most frequent procedure performed worldwide. Deciding which type of bariatric surgery should be performed in a particular patient can be a difficult task and should involve a multidisciplinary team that includes surgeons, endocrinologists, internists, nutrition specialists, and even psychologists or psychiatrists. The surgical treatment of obesity remains a rather controversial field. The purpose of this review was to clarify several myths and misconceptions regarding bariatric surgery, focusing specifically on sleeve gastrectomy, and the Roux in Y gastric bypass. (REV MEX ENDOCRINOL METAB NUTR. 2019;6:126-31)

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Key words: Obesity. Metabolic syndrome. Bariatric surgery. Sleeve gastrectomy. Gastric bypass.

RESUMEN

El manejo quirúrgico de la obesidad es el medio más eficaz de lograr una pérdida significativa de peso, siempre y cuando la cirugía se encuentre bien indicada y sea realizada por manos expertas. A pesar de que el primer procedimiento bariátrico data de 1954 cuando Kermen describió el bypass yeyuno-ileal[1], no fue hasta 1967 cuando Mason describe el bypass gástrico basándose en sus hallazgos de perdida de peso después de la cirugía de ulcera péptica[2]. Durante los últimos 60 años múltiples procedimientos bariátricos se han desarrollado. Actualmente el procedimiento mas frecuentemente realizado en Estados Unidos es la manga gástrica[3] sin embargo, a nivel mundial es el bypass gástrico en Y de Roux. Decidir cual es el procedimiento más adecuado para cada paciente puede ser una labor difícil y debe de involucrar a un equipo multidisciplinario que incluya a cirujanos, endocrinólogos, internistas, nutriólogos e incluso psicólogos o psiquiatras. El manejo quirúrgico de la obesidad sigue siendo un campo controversial. El propósito de esta revisión es clarificar algunos mitos y errores conceptuales que existen sobre la cirugía bariátrica, enfocándonos primordialmente en la manga y el bypass gástrico.

Palabras clave: Obesidad. Síndrome metabólico. Cirugía bariátrica. Gastrectomía en banda. Bypass gástrico.

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INTRODUCTION

Over the past 40 years, obesity has become a global health-care problem of pandemic proportions. Since Kremen described the jejunoileal bypass in 1954[1] and Mason performed the gastric bypass with the intent to lose weight[2] many changes have been done to the bariatric procedures with the intent to improve the outcomes, reduce morbidity and simplify techniques. At present the most common procedure done in the U.S.A is the sleeve gastrectomy[3], whereas the Roux in Y gastric bypass is the most frequently performed worldwide. Obesity is associated with multiple comorbidities such as diabetes mellitus, metabolic syndrome, hypertension, and dyslipidemia, with a negative impact on both the quality of life and the life expectancy of the patient[4,5]. Bariatric surgery is without a doubt the most effective means of dealing with obesity and its long-term superiority over pharmacological and nutritional therapies has been abundantly proven[6]. The decision as to which surgical procedure is better suited for a particular patient should involve a multidisciplinary team including surgeons, internists, endocrinologists, nutrition specialists, and psychologists or psychiatrists. The main objective of this review is to clarify the many myths and misconceptions regarding bariatric surgery.

MYTH #1 BARIATRIC SURGERY IS VERY DANGEROUS

Bariatric surgery is seen as a high-risk procedure by the general population and one of the most common reasons for declining it is the fear of complications. Such belief that bariatric surgery is dangerous is frequently perpetuated by some physicians who have neither the experience nor the knowledge regarding the modern management of obesity. In a recent study by Ju et al. from George Washington University, it was shown that the most common reason to decline bariatric surgery in a large cohort of otherwise eligible, morbidly obese patients were, in fact, a non-substantiated belief that the procedure was unacceptably risky[7]. Yet, according to the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program, the largest bariatric surgery database to date, the rate of complications is rather low. Most of the acute complications occur within 30 days of surgery and include bleeding (0.7%), wound infections (0.5%), urinary tract infections (0.3%), venous thromboembolism (0.3%), and anastomosis leak (0.2%), whereas the reported mortality is only 0.1-0.2%[8,9]. Putting into perspective the safety profile of bariatric surgery, it has been estimated that when properly indicated and performed, its short-term morbidity risk is similar to that seen in an uncomplicated laparoscopic appendectomy or cholecystectomy and its mortality rate is equivalent to that of a knee arthroplasty[10].

MYTH #2 BARIATRIC SURGERY = COSMETIC SURGERY

It is a common belief that bariatric surgery is purely cosmetic and that its sole purpose is to induce weight loss, so patients would look better. Although the cosmetic aspect of bariatric surgery is undeniable and without a doubt, weight loss is associated with significant improvements in self-esteem, this is just a secondary gain since the metabolic, cardiovascular, and respiratory benefits have been demonstrated repeatedly.

Obesity-related comorbidities such as the metabolic syndrome and obstructive sleep apnea improve significantly and, in some cases, even remit after successful bariatric surgery. The Swedish Obese Subjects study evaluated over 2000 obese patients who were subjected to bariatric surgery comparing them to over 2000 controls matched for the degree of obesity who declined the surgical alternative and followed them for 10-20 years. The striking findings in this study included an overall decrease in mortality rate (adjusted hazard ratio 0.71, 95% confidence interval 0.54-0.92, $p = 0.01$), as well as statistically significant lower incidences of diabetes, cerebrovascular events, myocardial infarctions, and cancer in the patients who underwent surgery compared

to those who did not[11]. In another retrospective, case–control study, the mortality rate of 2500 obese subjects who underwent bariatric surgery was significantly lower than that of 7500 age and weight-matched controls after 5 and 10 years of follow-up[5]. Furthermore, bariatric surgery in obese patients with type 2 diabetes mellitus seems to reduce the risk of micro- and macro-vascular events[12,13].

MYTH #3 BARIATRIC SURGERY WORKS ONLY BY EITHER RESTRICTING FOOD INTAKE OR BY LIMITING FOOD ABSORPTION

Although bariatric surgical procedures are classified as restrictive, when limiting the size of the stomach, or malabsorptive, when they bypass the segment of the bowel where food is absorbed, the mechanisms of weight loss go way beyond such a simplistic view. Basal energy expenditure decreases on dieting in an attempt to preserve body weight; in fact, this is part of the reason why keeping down the weight is so difficult[14]. In contrast, bariatric surgery results in an increased metabolic rate, preventing the patient from regaining the lost weight[15].

The biochemical and hormonal consequences of bariatric surgery are only recently beginning to be understood. Sleeve gastrectomy isolates or removes that part of the stomach where orexigenic hormones like ghrelin are produced. In normal conditions, ghrelin is synthesized and secreted by cells of the gastric fundus when it is empty and reaches the hunger center of the hypothalamus acting as an orexigenic signal that results in food intake; on the ingestion of food, stretching of the stomach stops the synthesis and secretion of ghrelin and thus results in satiety. Ghrelin is a potent growth hormone secretagogue and also regulates energy expenditure. The effects of gastric bypass procedures on ghrelin secretion are somewhat more conflicting with some studies reporting an increase and others a decrease in this hormone levels[16,17].

The presence of food in the distal small bowel results in the synthesis and secretion of peptide tyrosine-tyrosine (PYY) which leads to a decrease in gastric emptying and intestinal motility and also results in decreased appetite by acting on specific receptors in the hypothalamus. Circulating PYY levels increase after bariatric surgery due to the bypassing of the proximal bowel in the case of Roux-en-Y operations or due to the rapid gastric emptying and the consequent increase in carbohydrate delivery that ensues after sleeve gastrectomies[18]. Many other hormones have been linked to weight loss and metabolic improvement after bariatric surgery. Incretins are hormones released in the gastrointestinal tract in response to food intake that ultimately stimulates insulin secretion by pancreatic beta cells. The best-characterized incretins are glucagon-like peptide-1 and glucose-dependent insulinotropic peptide, both of which are tightly associated with the improvement in metabolic control of obese diabetic patients subjected to bariatric surgery[19].

Patients subjected to bariatric surgery tend to choose food products with a lower fat and carbohydrate content. Although this has been reproduced in animal models, the mechanisms underlying this food preference are not completely clear[20]. Besides, their well-documented role in the intestinal absorption of fat, bile acids are also known to participate in energy expenditure. Bile acid levels increase after bariatric surgery and have been associated with changes in feeding behavior[21]. Bariatric surgery also results in complex changes in the synthesis and secretion of cholecystokinin, oxyntomodulin, and leptin, as well as in important modifications of the intestinal microbiota[22]. Finally, it can be said that bariatric surgery results in profound molecular, biochemical, and hormonal changes that together contribute to weight loss and to the improvement in the metabolic profile of these patients.

MYTH #4 OBESE PEOPLE ARE LAZY AND UNMOTIVATED

Obese patients are greatly misunderstood by society as well as by many physicians. Obesity is a stigmatized condition, more so than any other health condition. Not infrequently, society and the medical establishment blame the obese patients themselves

for having this disease. The general belief is that "obese people eat too much and are lazy and unmotivated to get better." Obesity is a chronic disease, just like lupus, cancer, or schizophrenia. Obese patients are very sick people and should not be blamed for being so. Although undoubtedly psychosocial issues can alter the course and severity of obesity, there are many genetic, epigenetic, neurological, and hormonal aspects that remained to be clarified.

Although volition has an important role in feeding behavior, appetite is regulated in the hypothalamus and not in the brain cortex, just like thirst, body temperature, and energy balance and therefore does not entirely depend on willpower. Thus, it is not surprising that several studies have shown an almost universal weight regain after dieting. The autonomous nervous system establishes certain set points for weight and adipose tissue mass, so when an obese person loses a significant amount of weight, several physiological responses that increase hunger and decrease energy expenditure are triggered in an attempt to get back to the original state. A morbidly obese person, weighing 150 Kg, who loses 45 Kg and get down 105 Kg would have to ingest a significantly lower amount of calories to remain in that weight than a person who has been weighing 105 Kg for a long time. Leptin is an adipokine or hormone synthesized and secreted by adipose tissue that induces satiety acting at specific receptors in the hypothalamus. When a person loses weight, leptin levels decrease, promoting hunger, and an increased feeding behavior. Most energy expenditure is involuntary and derives from metabolic processes and thermogenesis. A very small amount of energy is spent on physical activities and exercise. Therefore, it is inappropriate to attribute weight gain to the lack of exercise[23,24].

MYTH #5 MOST PEOPLE WHO HAVE UNDERGO SURGERY REGAIN THEIR WEIGHT

The definition of weight regain varies greatly. More importantly, establishing what constitutes a clinically significant weight regain is an elusive goal. Illustrating this issue is a retrospective study by Lauti et al., in which six different definitions of weight regain were used retrospectively in the same cohort of patients. In this study, the prevalence of weight regain ranged from 9 to 90% at 5-year follow-up[25]. In a large retrospective study from the Veterans Administration Hospitals that evaluated close to 1800 patients, 82% of them followed for 10 years, the prevalence of weight regain, defined by getting back to a weight within 5% of baseline, was found to be only 3.4%[26]. The current consensus estimates that 10-20% of obese subjects subjected to bariatric surgery gain back a significant proportion of the lost weight on long-term follow-up[27]. Thus, not only more than 80% of patients are capable of keeping their weight down but also even in those who are not, the metabolic benefits of bariatric surgery are still evident[28].

MYTH #6 BARIATRIC SURGERY SHOULD BE THE LAST RESORT FOR MANAGEMENT OF OBESITY

The notion that bariatric surgery should be the last resort for the treatment of morbid obesity is truly outdated, since it stems from the 1991 National Institutes of Health guidelines, whereby such procedures were recommended only when the body mass index (BMI) is > 40 Kg/m^2 or > 35 Kg/m^2 in patients with comorbidities such as hypertension or diabetes. However, these guidelines do not consider neither the patient's metabolic state nor his/her ethnic background and recommend against the surgical management of patients with lower degrees of obesity even despite the coexistence of severe metabolic abnormalities. The Diabetes Surgery Summit II (DSS-II) was organized in 2016 with the purpose of providing physicians with evidence-based recommendations for the surgical treatment of diabetes and metabolic disorders. It is noteworthy that the DSS-II gathered 48 opinion leaders, the majority of them non-surgeons to avoid a potential bias, who objectively analyzed the available evidence. The main conclusion reached by this group of experts was that bariatric surgery should be entertained as

a viable therapeutic alternative for patients with BMIs > 30 Kg/m^2 (or > 27.5 Kg/m^2 in patients of Asian descent), in whom an adequate metabolic control cannot be achieved despite maximal medical therapy and lifestyle modifications[29-31]. In this regard, several studies have demonstrated that surgery can achieve significantly greater decrements in glycosylated hemoglobin than medical therapy in all types of diabetes.

MYTH #7 BARIATRIC PATIENTS HAVE SERIOUS HEALTH PROBLEMS CAUSED BY VITAMIN AND MINERAL DEFICIENCIES

Despite the proven benefits of bariatric surgery, several nutritional problems may develop. Several factors contribute to such nutritional abnormalities and include the type of surgery performed and the compliance with which the patient takes his/her prescribed vitamin supplements. Obesity is characterized by an expanded adipose tissue, a larger volume of distribution and a constant low-grade inflammatory state. These changes increase the oxidative stress and alter nutrient transporters, and together result in micronutrient deficiencies. Therefore, patients subjected to all types of bariatric surgery should be started on lifelong vitamin and mineral supplementation postoperatively, and measurements of vitamin levels should be done periodically. Some vitamins and minerals require gastric acid and/or intrinsic factor for a proper absorption[32]. Thus, although in most cases, some degree of vitamin malabsorption is unavoidable, the resulting deficiencies can be solved by careful supplementation and periodic surveillance[33].

CONCLUSIONS

Despite the myths and misconceptions alluded to before, bariatric and metabolic surgery has multiple advantages and there is solid evidence that it improves the quality of life and the life expectancy of the patient. It is unfortunate that society at large and frequently the medical establishment itself view obesity as a purely cosmetic problem resulting from lack of motivation of the patients and not as the potentially deadly disease that it really is. Bariatric surgery might be perceived as a radical solution, however when properly indicated and performed, it offers the patients a unique opportunity to return to a more productive and meaningful life.

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