SOUTHERN SURGICAL ASSOCIATION ARTICLE

Short-Term Preoperative Weight Loss and Postoperative Outcomes in Bariatric Surgery

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BACKGROUND: Preoperative weight loss is often encouraged before undergoing weight loss surgery. Controversy remains as to its effect on postoperative outcomes. The aim of this study was to determine what impact short-term preoperative excess weight loss (EWL) has on postoperative outcomes in patients undergoing primary vertical sleeve gastrectomy (SG) or Roux-en-Y gastric bypass (RYGB).

STUDY DESIGN: All patients who underwent SG (n = 167) or RYGB (n = 188) between 2014 and 2016 and who completed our program-recommended low calorie diet (LCD) for 4 weeks immediately preceding surgery were included. These patients (N = 355) were then divided into 2 cohorts and analyzed according to those who achieved ≥8% EWL (n = 224) during the 4-week LCD period and those who did not (n = 131). Primary endpoints included percent excess weight loss (% EWL) at 1, 3, 6, and 12 months postoperatively.

RESULTS: Patients achieving ≥8% EWL preoperatively experienced a greater % EWL at postoperative month 3 (42.3 ± 13.2% vs 36.1 ± 10.9%, $p < 0.001$), month 6 (56.0 ± 18.1% vs 47.5 ± 14.1%, $p < 0.001$), and month 12 (65.1 ± 23.3% vs 55.7 ± 22.2%, $p = 0.003$). Median operative duration (117 minutes vs 125 minutes; $p = 0.061$) and mean hospital length of stay (1.8 days vs 2.1 days; $p = 0.006$) were also less in patients achieving ≥8% EWL. No significant differences in follow-up, readmission, or reoperation rates were seen. Linear regression analysis revealed that patients who achieved ≥8% EWL during the 4-week LCD lost 7.5% more excess weight at postoperative month 12.

CONCLUSIONS: Based on these data, preoperative weight loss of ≥8% excess weight, while following a 4-week LCD, is associated with a significantly greater rate of postoperative EWL over 1 year, as well as shorter operative duration and hospital length of stay. (J Am Coll Surg 2018;■:1−11.
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The disease of obesity remains one of the most vexing medical epidemics in the US.[1] Moreover, the disease process is closely associated with other medical comorbidities (eg type 2 diabetes mellitus and hypertension) that have a direct effect on the patient's quality of life and lifespan.[2] Despite efforts to control the epidemic with preventative strategies, the burden of this disease continues to strain health care budgets and affect national health care policy.[3] Patients are often exposed to a variety of treatment options for their disease and its associated comorbidities. One of these options, metabolic and bariatric surgery, has been shown to be an extremely effective strategy for mitigating obesity-related comorbidities and reducing obesity-related morbidity and mortality.[4-6]

As the techniques of bariatric surgery have been refined in recent decades, the rate of perioperative complications associated with the most common operations, namely the

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Abbreviations and Acronyms

EHR = electronic health record
EWL = excess weight loss
LCD = low calorie diet
LOS = length of stay
RYGB = Roux-en-Y gastric bypass
SG = vertical sleeve gastrectomy

Roux-en-Y gastric bypass (RYGB) and the vertical sleeve gastrectomy (SG), have dramatically decreased.[7] Although progress has been made to nationally standardize bariatric surgical programs and techniques through the efforts of the American Society of Metabolic and Bariatric Surgery and the American College of Surgeons, there has been continued debate on the ideal patient preparation for surgery.[8]

Currently, there are several competing schools of thought on how best to prepare a patient for the dramatic emotional and lifestyle changes specifically associated with weight loss surgery, in addition to the typical rigors and physiologic stress associated with any surgery.[9] Insurance companies often require extensive weight loss attempts before allowing coverage for bariatric surgery, and these mandated programs can last between 3 and 12 months. However, multiple studies have shown there to be no definitive perioperative or postoperative advantage for patients who participate in insurance-mandated weight management programs.[10,11] Instead, these requirements only increase risk of unnecessary surgery delay and patient attrition.[10]

In contrast to insurance-mandated weight management programs, surgeon- or program-managed preoperative weight loss programs, including a short-term diet intervention, have been proposed to yield physiologic and anatomic patient improvements before surgery.[12] Studies have suggested that short-term preoperative weight loss can have a positive impact on operative complexity and operative morbidity, as the size of the liver and intra-abdominal fat mass would be reduced.[12-16] In addition to the beneficial effect on perioperative complications, questions remain as to whether a preoperative low-calorie diet (LCD) can have an impact on weight loss after surgery as well.[17]

At our institution, we have historically asked patients to lose $\geq$8% of their excess weight preoperatively by following a program-recommended LCD for 4 weeks immediately preceding surgery. At the inception of the LCD, there was ample evidence that these types of diets may play a role in hepatic volume reduction, thereby making bariatric surgery more technically feasible.[13,14,18-20] Our group has previously published that almost 40% of our patients were unable to meet the program-suggested weight loss goal due to a variety of factors, including demographic characteristics and extent of comorbidity.[21] The purpose of this study was to determine what impact significant preoperative excess weight loss (EWL) has on patient outcomes after weight loss surgery.

METHODS

Patient population

Our prospective Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program database was used to identify all patients who completed our program-recommended 4-week preoperative LCD before undergoing SG or RYGB between January 2014 and January 2016. This date range was chosen because a majority of patients from this time period followed the same preoperative and postoperative program-directed protocol, were evaluated by the same clinician team at the program's primary office location, and had at least 1 year of postoperative data available for review.

Patient inclusion and exclusion criteria are outlined in Figure 1. Patients were included in the study if they were aged 21 to 75 years at program enrollment, had a BMI $\geq$ 35 kg/m^2 at initiation of the LCD, completed the 4-week preoperative LCD per protocol, underwent primary SG or RYGB (ie surgery was not aborted), and had no documented postoperative diagnosis of chronic illness (ie cancer) or pregnancy that could affect achievement of weight loss goals. Patients were excluded if they underwent preoperative nutrition or psychological evaluation by another team of clinicians (ie not through primary program center), did not complete the preoperative LCD per protocol (ie modification due to renal disease or patient surgical risk, completion of LCD more than once before surgery), or underwent surgical revision.

Complete data for primary and secondary study outcomes were available for all patients included in this study. No patients were excluded from study inclusion or analysis because of missing data. The study was reviewed and approved by our institutional review board.

Preoperative program-directed protocol

Preoperatively, all patients were evaluated by a program nutritionist, licensed clinical therapist, and surgeon. All patients also attended 10 face-to-face support groups addressing behavioral lifestyle interventions (diet education, physical activity, and behavioral strategies) led by a program nutritionist, licensed clinical therapist, or surgeon at the primary program office. Last, all patients

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