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Does preoperative weight loss predict success following surgery for morbid obesity?

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Abstract

BACKGROUND: We analyzed preoperative weight loss as a predictor of postoperative success in patients after bariatric surgery.

METHODS: Data were obtained from a retrospective chart review of 562 patients in a multidisciplinary obesity clinic.

RESULTS: One hundred forty-six patients met the inclusion criteria (23 men and 123 women). The mean age was 39.5 years, and the mean body mass index (BMI) was 52.6 kg/m². Comorbid disease includes diabetes (15.7%), hypertension (30.8%), mental illness (38.4%), and musculoskeletal disease (56.8%). Procedures performed were 16 vertical band gastroplasties, 43 open gastric bypasses, 52 laparoscopic gastric bypasses, and 35 laparoscopic adjustable gastric bands. Preoperative weight change was as follows: 31 patients gained weight (21.2%), 56 patients lost weight (38.3%), and 59 patients maintained their weight (40.4%). Postoperative weight loss was not influenced by preoperative weight change among women. However, men who gained weight preoperatively had significantly worse outcomes.

CONCLUSIONS: Patients may achieve satisfactory early postoperative outcomes despite inconsistent or marginal preoperative weight change.

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Bariatric surgery is the only evidence-based approach to achieving sustainable weight loss in morbidly obese adults.¹ Recent data indicate a long-term survival benefit for patients who maintain weight loss after surgery.^{2,3} However, these same data indicate a long-term trend of recidivism (weight regain) especially after purely restrictive surgical procedures (ie, vertical band gastroplasty and adjustable gastric band). The reasons for this trend have not been clearly shown.

The goal of evaluating and counseling a patient on life-

style choices (nutrition, physical activity, and behavior modification) is to identify and change those habits that may conflict with long-term weight maintenance after surgically induced weight loss. The Canadian Clinical Practice Guidelines for the management of obesity suggest a goal of 10% reduction of body weight in 6 months after nutritional counseling to change eating habits and physical activity.⁴ If a patient does not meet this goal, he/she may not be compliant with specific recommendations and may be unprepared for the dramatic changes accompanying restrictive surgical procedures. The National Institutes of Health criteria make recommendations for surgery based on body mass index, comorbid disease, and a history of failed weight loss attempts but do not take into account variations in compliance.⁵

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Table 1 Sample demographics

	Men	Women	Total
N	23	123	146
Age (y)	40.3 (20–58)	39.57 (18–63)	39.5 (18–63)
Weight (kg) (measured)	176.5 (116–227)	140.7 (87.5–246)	166.5 (87.5–246)
Height (cm) (measured)	177.1 (168–195)	164.5 (147–186)	146.4 (147–195)
BMI (kg/m ²)	57 (39–72)	51.9 (34–95)	52.6 (34–95)

Our clinical experience suggests that most patients struggle with lifestyle change despite intense multidisciplinary evaluation, counseling, and support in preparation for bariatric surgery, and not all are successful in achieving a meaningful lifestyle modification. We believe preoperative weight loss may be a surrogate for compliance with lifestyle recommendations and may predict long-term success of bariatric surgery. In this study, we analyzed preoperative weight loss and measured this as a predictor of early postoperative success in patients after bariatric surgery.

Methods

Data were obtained from a retrospective chart review of 562 patients that presented for assessment at a multidisciplinary obesity clinic from February 1, 2003, to February 1, 2007. These dates correspond to the formation of the Bariatric Surgery Clinic at the Royal Alexandra Hospital in Edmonton. Patients were excluded from analysis if they did not have bariatric surgery or if they had not progressed beyond 6 months of postoperative follow-up. Patient outcomes were assessed at 3 months, 6 months, 1 year, 18 months, and at 2 years.

The primary outcome of this study was the correlation of preoperative weight change with postoperative weight loss at 1 and 2 years. Data analysis was performed by using a mixed procedure for repeated measures.

Results

Out of 562 charts that were reviewed, 288 patients underwent surgery. Six of these patients have died, 40 were followed up in different centers, and 96 were excluded because postoperative follow-up had not progressed beyond 6 months, leaving 146 patients were for analysis. The basic

Table 2 Characteristics of patient follow-up

Follow-up	n	Eligible patients (%)
3 m	135	92.5
6 m	132	90.4
12 m	96	65.8
18 m	69	47.3
24 m	38	26

demographics of the study sample are shown in [Table 1](#). Comorbid disease included type II diabetes in 25 patients (15.7%), hypertension in 42 patients (30.8%), mental illness in 63 patients (38.4%) and musculoskeletal disease in 96 patients (56.8%). Procedures performed were 16 vertical band gastroplasties, 43 open gastric bypasses, 52 laparoscopic gastric bypasses, and 35 laparoscopic adjustable gastric bands. The mean duration of preoperative evaluation and counseling was 275.5 days (range 100–737 days). The characteristics of patient follow-up are shown in [Table 2](#).

Preoperative weight change was empirically defined as a greater than 2% change from baseline body weight. This was observed in 56 patients who lost weight (38.4%) and 31 patients who gained weight (21.2%). Fifty-nine patients (40.4%) experienced no overall change in their baseline body weight before surgery despite intense lifestyle counseling. The pattern of weight change among those patients who lost or maintained their weight ($\pm 2\%$ of baseline) is shown in [Figure 1](#).

The aggregate postoperative weight loss observed in the study sample is shown in [Table 3](#). In a longitudinal assessment of weight of all patients over time, postoperative weight loss was not influenced by preoperative weight change among women ([Table 4](#)). However, among men (23 subjects), the relationship was significant ($P = .02$). Men who gained weight preoperatively had the worst outcomes postoperatively ([Fig. 2](#)).

Comments

Morbidly obese patients struggle with lifestyle change despite recommendations made within the supportive envi-

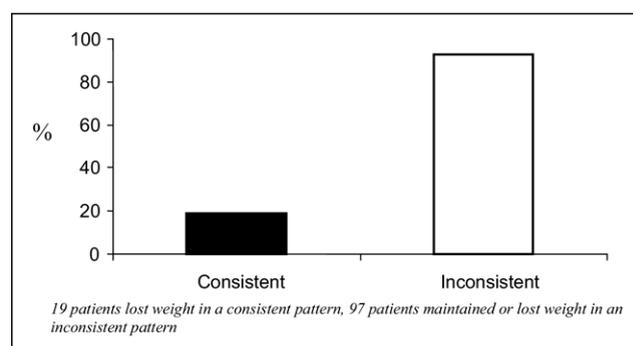
**Figure 1** Pattern of pre-operative weight change.

Table 3 Postoperative weight loss

Follow-up	Mean %WL	Range
3 m	13.2	-.05 to .30
6 m	21.1	-.22 to .44
12 m	29.3	.04-.53
18 m	33.2	.04-.57
24 m	33.8	.06-.63

%WL = percent weight loss (from baseline).

ronment of a multidisciplinary bariatric surgery clinic. Those patients who are unsuccessful in achieving a meaningful lifestyle change may be at risk for long-term failure of weight maintenance after surgically induced weight loss. In this study, we have shown that early postoperative weight loss is not influenced by preoperative weight change among women. However, men who gained weight preoperatively may experience less satisfactory outcomes postoperatively. We have also shown that even in those patients who achieve preoperative weight loss, the principle pattern of weight change is inconsistent and fluctuating.

Preoperative weight loss is desirable for several reasons. It produces clinically important improvements in the comorbid diseases associated with obesity, which could conceivably reduce postoperative complications.¹ It may also facilitate surgical management by reducing liver size and visceral fat.⁶ Previous studies have suggested that operating time for laparoscopic gastric bypass may be reduced appreciably with a 5% reduction in weight preoperatively.⁷

The method of achieving preoperative weight loss may be important. Our approach is an intensive multidisciplinary approach that typically requires considerable time and expertise, specifically from registered dietitians. We have shown that this approach achieves weight loss or maintenance in almost 80% of our patients. Considering that the baseline pattern in morbid obesity is slow, steady weight gain, weight maintenance also represents an important clinical outcome and is not a reflection of a lack of change. In the United States, certain insurance companies have mandated that a 5% to 10% preoperative weight loss and a series of consultations with a nutritionists be completed before approving patients for surgery.⁸ Interestingly, this is seen by some as a barrier to patient access to bariatric surgery.⁹ A program of liquid meal replacements or meal supplements

Table 4 Correlation of preoperative weight change and postoperative weight loss

Follow-up	Mean %WL	R	P value
3 m	13.17	-0.18	.04
6 m	21.08	-0.58	.50
12 m	29.30	0.09	.38
18 m	33.16	0.13	.29
24 m	33.81	0.08	.64

%WL = percent weight loss (from baseline).

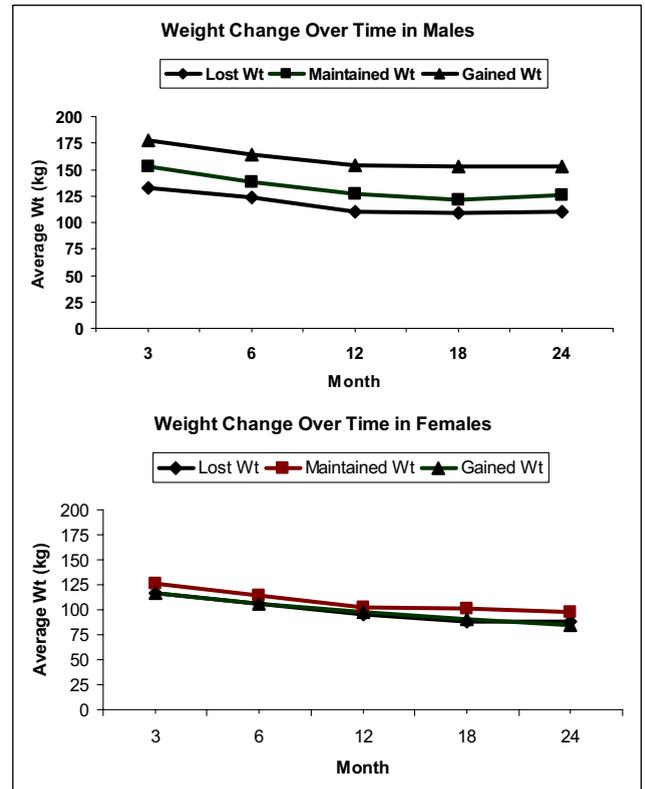


Figure 2 Post-operative weight stratified by pre-operative weight change and gender.

for preoperative weight loss is an alternative approach to preoperative weight loss but may not produce the same lifestyle modification as educational sessions with a nutritionist. Reliance on liquids for nutrition or meal replacements may lead to maladaptive eating behaviors, unsatisfactory clinical outcomes, nutritional complications, or gradual weight gain. However, the relationship between preoperative eating behaviors and postoperative outcomes remains complex, and studies have not succeeded in elucidating a clear relationship.^{10,11}

Alami et al¹² have recently reported early outcomes in a small cohort of patients from a randomized clinical trial studying the effects of preoperative weight loss on patient outcomes after laparoscopic gastric bypass. They found that preoperative weight loss produced an isolated improvement in excess weight loss at 3 months, which was not carried over to 6 months. They also identified reduced operating time in patients with preoperative weight loss. Two further retrospective studies have not shown a clear relationship between preoperative weight loss on early postoperative outcomes after laparoscopic gastric bypass.^{13,14}

The limits of this study are primarily related to the length of follow-up and sample size. The most important outcome after bariatric surgery is the long-term sustainability of the surgically induced weight loss. Our data show short-term trends; further long-term data are required to understand what may lead to recidivism in patients after bariatric surgery. These data may help to improve the educational strategies used for lifestyle modification in morbidly obese pa-

tients and would support a bariatric surgery program. In addition, it would be valuable to differentiate outcomes across the various surgical procedures completed in our patient sample and to separate purely restrictive procedures from mixed restrictive and malabsorptive procedures.

We have shown that patients may achieve satisfactory early postoperative outcomes despite inconsistent or marginal preoperative weight change. Preoperative weight change may not fully reflect compliance with lifestyle recommendations. Therefore, patients should not be considered poor candidates for surgery based on preoperative weight change alone. Further study is required to examine the impact of preoperative weight change in the long-term.

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Discussion

Robert Martindale, M.D. (Portland, OR): Predicting postoperative success after bariatric surgery has received signif-

icant recent attention because of the popularity of some insurance companies in the United States mandating preoperative weight loss as much as 10% over the 6 months before issuing authorization. In addition, the Canadian Clinical Practice Guidelines for the management of obesity suggest a goal of 10% reduction in body weight in the 6-month period before bariatric surgery.¹ The potential benefits of preoperative weight loss have been well described to include ease of laparoscopic procedure by minimizing the hepatic parenchyma size,² reduced operating time,³ discouraging those “less motivated,”⁴ and improve overall outcome.^{5,6}

Several academic institutions and governmental agencies have evaluated this to include MedTAP report to the Oregon Health Commission and all have concluded that the evidence to mandate preoperative weight loss is lacking.

The current article “Does Preoperative Weight Loss Predict Success After Surgery for Morbid Obesity” attempts to further elucidate this issue and determine if the patient’s ability to lose weight preoperatively can serve as a “surrogate for compliance” with lifestyle recommendations in the postoperative setting. This article is a well-written retrospective chart review of 146 patients by the group from Edmonton, Alberta, Canada. The group included 23 men and 123 women with a mean BMI of 52.6 kg/m². Various bariatric procedures were included in the study to include 16 vertical band gastroplasties, 43 open gastric bypasses, 52 laparoscopic gastric bypasses, and 35 laparoscopic adjustable gastric bands.

The patients were followed for up to 24 months, but the majority only had a 6-month follow-up. Preoperative weight change was defined as greater than 2% from baseline body weight. Of the patients who completed follow-up of at least 6 months, 38.4% decreased weight, 40% had no change in weight, and 21.2% gained weight.

The study concluded that preoperative weight loss of greater than 2% in women was not predictive of postoperative weight loss, but it was predictive in the 23 male subjects studied. They also concluded that those who fail to lose weight should not be considered poor candidates for bariatric procedures. Attempting to find the “magic bullet” that will predict postoperative compliance with “lifestyle recommendations” and weight loss is a laudable goal. The current study is an addition to those attempts, and the authors should be congratulated on the diligent work.

I have several questions for the authors: (1) Do the authors believe their sample sizes allow them to make these predictions with adequate accuracy? (2) Do the authors believe combining all the types of bariatric surgery procedures together alters the ability to make their conclusions and any postoperative predictions? (3) Why was the 2% weight change chosen as the study parameter (that appears to be a modest amount of weight loss considering most organizations that suggest weight loss recommend 10% weight loss)? and (4) Can the authors elaborate on the available preoperative lifestyle and weight reduction coun-

seling that was available to the patients and what percent of the study patients fulfilled these requirements?

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