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Original article

Goal-directed program after sleeve gastrectomy improves weight loss

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Abstract

Background: The aim of our study is to determine if a goal-directed program improves weight loss after sleeve gastrectomy.

Methods: Our goal-directed program involves setting excess weight loss targets at fixed intervals after sleeve gastrectomy. We identified patients in 3 bariatric centers between April 2010 and July 2013 and compared the center that has a goal-directed weight loss program (goal-directed program) with the other 2 centers (standard program).

Results: A total of 211 patients were included, with 129 patients in the goal-directed weight loss program. The 2 groups were similar in terms of gender distribution, ethnicity distribution, age, and preoperative weight, preoperative body mass index, and surgical technique. The follow-up rates at 3, 6, 9, and 12 months for patients in the goal-directed program was 84.5%, 75.2%, 59.7%, and 82.2%, respectively, compared with 65.9%, 68.3%, 51.2%, and 68.3% for the standard program. The percentage total weight loss at 3, 6, 9, and 12 months was 17.1%, 23.3%, 26.8%, and 28.6%, respectively, for the goal-directed program, compared with 15.3%, 21.8%, 24.4%, and 25.4%, respectively, for the standard program. The mean excess weight loss at 3, 6, 9, and 12 months were 40%, 54%, 62%, and 67%, respectively, for the goal-directed program group, and 36%, 50%, 54%, and 55%, respectively, for the standard program, where statistical significance ($P < .005$) was achieved at 12 months.

Conclusion: Our results suggest that a goal-directed protocol may improve weight loss outcomes after laparoscopic sleeve gastrectomy. (Surg Obes Relat Dis 2015;▮:00–00.) © 2015 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords: Goal-directed program; Sleeve gastrectomy; Bariatric program

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Bariatric surgery is a standard treatment for the severely obese patient, having been found to be the most effective

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and durable treatment for morbid obesity [1]. The number of bariatric surgeries in Asia has increased by 449% from 381 in 2004 to 2091 in 2009. The popularity of laparoscopic sleeve gastrectomy (LSG) in Asia has increased exponentially, with LSG comprising 1% of all bariatric procedures performed in 2005 but 25% in 2009 [2]. The excess weight loss (EWL) at 24 months for LSG (61.3%) and gastric bypass (69.6%) has been reported to be comparable [3]. With LSG fast becoming the most common bariatric procedure in Asia, emphasis on perioperative management is imperative to optimize weight loss outcomes for LSG.

The robust effects of goal setting (success rates of 90%) and the methods behind goal setting are well described and studied in the field of psychology [4]. We hypothesized that a goal-directed program improves the EWL outcomes of patients after LSG and tested this hypothesis with prospective data.

Methods

In most practices, bariatric patients are managed by a multidisciplinary team comprised of bariatric surgeons, dietitians, physiotherapists, and physicians. Previous patients undergoing bariatric surgery in the standard program often enquired about the expected EWL targets after bariatric surgery. This patient-driven need led to the development of the goal-directed weight loss program. This modified program involves counseling bariatric patients before LSG and setting EWL targets to achieve at fixed intervals after LSG. The EWL targets given to patients are 15%, 15%, 30%, 20%, and 20% at 1, 3, 6, 9, and 12 months post-LSG, respectively. For patients with body mass indices (BMIs) of >50 kg/m^2, the EWL targets are 15%, 15%, 20%, 10%, 10%, 10%, 10%, and 10% at 1, 3, 6, 9, 12, 15, 18, and 21 months post-LSG, respectively. These targets are percentages of the initial excess weight, summing up to a total of 100% of the initial excess weight. The targets were derived based on our institution's experience of weight loss patterns in patients who underwent laparoscopic sleeve gastrectomy at our institution. These targets are charted on a graph, with the patient's actual weight charted on the same graph at each clinic consultation, providing a strong visual aid to counseling and motivation. There were no additional remedial interventions to reinforce these targets in the goal-directed program.

A case-control retrospective analysis of prospectively collected data from 3 bariatric centers in Singapore was conducted on patients who underwent LSG performed between April 2010 and July 2013. The goal-directed weight loss program was conducted in one of the centers for all its patients (goal-directed program), and a standard program was used by the other 2 centers (standard program). Across the 3 centers, patients were managed by a multidisciplinary team that minimally comprises a bariatric surgeon, a dietitian, and a physiotherapist. The surgical technique of performing LSG was also comparable for all patients because all centers had an antral pouch size of 5–6 cm.

Statistical analysis

To compare patient characteristics between the 2 groups of patients, we used the Fisher's exact tests and 2-sample t tests for categorical and continuous variables, respectively. For the EWL data at 3, 6, 9, and 12 months post-LSG, the mean EWL between the 2 groups at each time point was compared using the 2-sample t test (2-tailed P value). Next, we used the generalized estimating equations (GEE) approach [5] to fit the multiple linear regression to the longitudinal EWL data, which factors in the correlation of EWL readings at 3, 6, 9, and 12 months within an individual. We adjusted for age, gender, ethnicity, and preoperative weight and BMI by including these variables in the mean structure of the regression model as fixed effects where age and BMI were categorized into 4 groups based on the quartiles. We specified a working correlation with an auto-correlation structure of order 1, where time is treated continuously, and used the sandwich estimator to obtain robust standard errors. We used the Wald statistics to conduct hypothesis tests. The estimated marginal mean [6] of EWL at 3, 6, 9, and 12 months post-LSG were used to plot the trajectory of the expected EWL between the 2 programs where the profile of the "average" member is such that the levels within each categorical confounder are distributed according to the 211 patients in the study. A P value $<.05$ was considered as statistically significant. We used R statistical software version 3.1.2 (R Development Core Team, Vienna, Austria) to perform the statistical analysis, and we used the R package geepack to perform the GEE modelling.

Results

Two hundred eleven patients underwent LSG, with 129 of them enrolled in the goal-directed program and 82 patients in the standard program. The 2 groups were statistically similar in terms of gender distribution, ethnicity distribution, age, preoperative weight, and preoperative BMI (Table 1).

Three patients in the goal-directed program group developed complications (2.3%). One patient developed a stricture, which was managed nonoperatively; 1 patient had significant hemorrhage, which was managed conservatively; and 1 patient required a second operation for iatrogenic small bowel perforation. Three patients in the standard group developed complications (3.7%). Two patients suffered significant hemorrhage, with 1 requiring a second operation for hemostasis. One patient in the