

Original article

# Association between support group attendance and weight loss after Roux-en-Y gastric bypass

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## Abstract

**Background:** Attending support group meetings has been linked to increased weight loss after gastric bypass surgery. However, the degree to which support group attendance influences weight loss is still unclear. This study quantitatively described the association between support group attendance and weight loss after Roux-en-Y gastric bypass.

**Methods:** The weight loss data and support group attendance of 78 consecutive Roux-en-Y gastric bypass patients were studied retrospectively. The patients were analyzed in 2 groups: those who attended >5 monthly support group meetings (group A) compared with those who went to ≤5 support group meetings (group B). The data from the first 12 months after surgery were analyzed.

**Results:** Group A achieved a mean percentage of excess weight loss of 10.5% at 2 weeks after surgery, 21.4% at 6 weeks, 30.9% at 3 months, 45.4% at 6 months, 53.6% at 9 months, and 55.5% at 12 months. Group B achieved a mean percentage of excess weight loss of 11.3% at 2 weeks, 21.8% at 6 weeks, 31.8% at 3 months, 41.3% at 6 months, 45.2% at 9 months, and 47.1% at 12 months. The differences between the 2 groups were significant at  $P < 0.05$  at 9 and 12 months. The weight loss was nonlinear and slowed as patients approached 1 year after surgery.

**Conclusion:** Support groups are important for maintaining weight loss throughout the first year after surgery, especially after 6 months when the rate of weight loss from surgery begins to naturally decline. The amount of postoperative weight loss was greater than, or comparable to, the published data. Implementing regular support groups within the postoperative follow-up care may provide patients with the best chances of achieving maximal weight loss. (*Surg Obes Relat Dis* 2008;4: 100–103.) © 2008 American Society for Metabolic and Bariatric Surgery. All rights reserved.

**Keywords:** Support groups; Weight loss; Laparoscopic Roux-en-Y gastric bypass; Morbid obesity

The prevalence of obesity in the United States has increased dramatically during the past several decades [1–3]. Morbid obesity, defined as a body mass index  $\geq 40$  kg/m<sup>2</sup>, has been shown to reduce life expectancy by 5–20 years [4,5]. Surgical treatment for morbid obesity is the most effective means to achieving weight loss and reducing comorbidities. In recent years, Roux-en-Y gastric bypass (RYGB) has become the most commonly performed bari-

atric procedure, accounting for 65% of bariatric operations worldwide [6]. RYGB is more effective in reducing weight than other commonly used procedures such as vertical banded gastroplasty and adjustable gastric banding [7]. Currently, slightly more than one half of RYGB procedures are done laparoscopically, rather than by the open approach [6,7]. Evidence has shown that laparoscopic RYGB involves less blood loss and shorter hospital stays, but both approaches are safe and effective in reducing weight [7–14].

In addition to surgery, support groups are an integral component of the weight management process. Evidence has suggested that support groups provide patients with a

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sense of connection among peers and help them adhere to weight loss programs [15]. Participation in support groups has been linked to increased weight loss after RYGB and adjustable gastric banding [16,17]. However, there is a shortage of studies that have quantified this relationship between weight loss and social support. The broader published data on the psychosocial predictors of weight loss have also been far from conclusive [18–22]. The purpose of this study was to quantitatively describe the trajectory of weight loss after RYGB and the association between weight loss and attending support group meetings. We hypothesized that support groups would help patients achieve greater weight loss.

## Methods

This study consisted of 78 consecutive patients who had undergone laparoscopic RYGB from February 2004 to May 2006 at our community teaching hospital. All patients had completed a required 6-month counseling program before surgery. The counseling program included consultations with surgeons, nurse practitioners, psychiatrists, and nutritionists. The program also involved an information video, assessments and questionnaires, and monthly support group meetings. After completion of the program, the candidates were eligible to undergo laparoscopic RYGB. All the operations were performed by the same team of surgeons. Postoperative follow-up visits were scheduled at 2 and 6 weeks, 3, 6, 9, and 12 months, and annually thereafter. Data on weight loss, eating habits, and life factors were collected at every follow-up visit, each of which included a counseling session with a nutritionist. The patients were encouraged to continue attending the support group meetings after surgery as a way of sharing their experiences with their peers.

The monthly peer support group meetings highlight the longitudinal nature of the overall surgical program experienced by these patients. The meetings help initiate the education process before surgery and evolved into a part of the follow-up care after. The support group is conducted in an open forum format to allow patients to address those issues of most concern to them at the meeting. The support group leaders (surgeon, nurse practitioner, and nutritionist) use the issues brought up by the patients as an opportunity to educate the group, for example, regarding healthy diet choices or the need to exercise for continued weight loss. Often, emotional concerns arise, such as replacing the coping aspect of food. The open forum discussion format allows the patients to support each other in a nonthreatening and noncontrived atmosphere. Our belief is that if patients know they are under no pressure to speak, they will be more at ease as they absorb new knowledge, reinforce old knowledge, and identify with their peers. Thus, participation was purposefully not documented. The support group meetings take place on the campus of the hospital and last between 1 and 2 hours. The time is unstructured, and the patients

direct the group discussion by bringing up topics of interest. One of the most important features of the support group meetings is that they are attended by patients at various points in their preoperative and postoperative tracks, enabling almost everyone to both teach and learn during the same session. An average of 15–20 patients attended each support group meeting.

Weight loss data were collected by chart review. Support group attendance was documented with attendance sheets at each session. The institutional review board approved the study by way of an expedited review. If follow-up appointments had been missed, because of either a one-time no-show or permanent loss to follow-up, the data imputation method of the last value carried forward was used in the statistical analysis. All patients in the study attended the follow-up visits at least 3 of the 6 designated times within 1 year after surgery. As expected, loss to follow-up was more of a problem the farther removed from surgery. The 95% confidence intervals for regression coefficients are presented, and  $P < .05$  was considered statistically significant. All analyses were performed using in Stata, version 8.2, software.

## Results

A total of 78 patients comprised the study population. Of the 78 patients, 28 attended  $>5$  support group meetings and comprised group A, and 50 attended  $\leq 5$  support group meetings and comprised group B. Table 1 lists the baseline characteristics and support group attendance of both groups.

A significant difference in weight loss was found between the 2 groups at 9 and 12 months after surgery ( $P = .002$ ). Differences at the earlier follow-up times were not significant (Table 2). Fig. 1 shows the overall trajectories of weight loss for the 2 groups; the difference was significant at  $P = .0006$ . Both cohorts experienced very similar weight loss trajectories during the first 6 months. Thereafter, however, patients in group A experienced more weight loss than patients in group B, even as weight loss for both groups proceeded to gradually level off. In this manner, weight loss was seen as inherently nonlinear after surgery.

Table 1  
Baseline characteristics

Characteristic	Group A ( $>5$ SGMs; $n = 28$ )	Group B ( $\leq 5$ SGMs; $n = 50$ )
Women (n)	4 (14)	6 (12)
Age (y)	42 $\pm$ 8.74	42 $\pm$ 9.66
Preoperative weight (kg)	144.85 $\pm$ 30.63	137.69 $\pm$ 23.81
Ideal weight (kg)	58.25 $\pm$ 11.49	58.97 $\pm$ 8.88
Preoperative BMI (kg/m <sup>2</sup> )	52.78 $\pm$ 9.60	49.66 $\pm$ 8.14
SGMs attended	9.96 $\pm$ 3.63	2.66 $\pm$ 1.39

SGMs = support group meetings; BMI = body mass index.  
Data in parentheses are percentages.

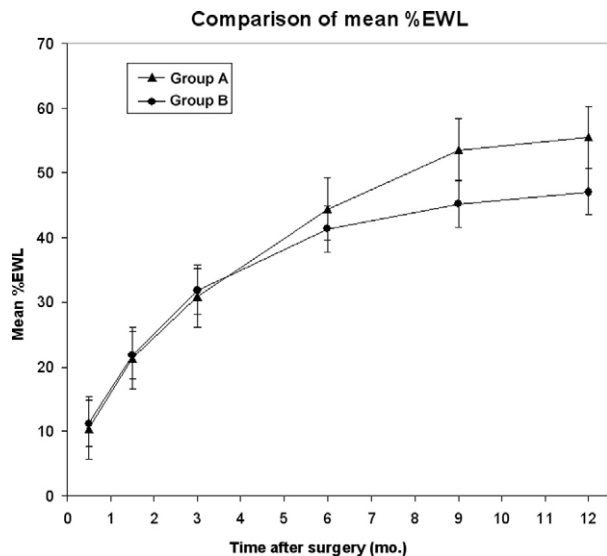


Fig. 1. Comparison of mean percentage of excess weight loss (%EWL) between groups A and B.

## Discussion

As the use of RYGB continues to grow [6,7,23], it is important for surgeons and patients to understand the trajectory of postoperative weight loss and interventions that may help patients achieve maximal weight loss. In this study, weight loss was associated with the number of support group meetings attended. Patients who attended >5 support group meetings had an average of 55.5% excess weight loss at 12 months compared with 47.1% excess weight loss in patients who attended ≤5 support group meetings. In a recent study, laparoscopic adjustable gastric banding patients who attended support group meetings had achieved a mean body mass index decrease of  $9.7 \pm 1.9$  kg/m<sup>2</sup> at 1 year postoperatively compared with a body mass index decrease of  $8.1 \pm 2.1$  kg/m<sup>2</sup> in patients who did not attend the support group meetings [16]. Our results support this positive effect of support group attendance.

A 1998 study by Hildebrandt [17] also found a statistically significant trend for greater weight loss in RYGB patients who attended support group meetings than for those who did not. Hildebrandt suggested that a critical number of support group meetings might exist that patients must attend to gain a substantial benefit, because attending 1 or 2 meetings was not very helpful. Our results have supported this claim. We found a significant difference in weight loss between those who attended >5 meetings and those who attended ≤5 within 12 months postoperatively. Thus, 5 support group meetings might be an appropriate benchmark for patients and programs to consider. Also, the difference in weight loss between these 2 cohorts only surfaced after 6 months postoperatively. This suggests that attending support group meetings is important for sustaining healthy behavior longer, especially during the 6–12-month period

after surgery when weight loss naturally slows down. It might be beneficial for programs to offer additional counseling or support group intervention at the 6-month postoperative mark.

Differences in weight loss between patients undergoing surgery earlier versus later were not detected. We do not believe any differences in techniques resulted from a learning curve between the earlier and later cases. Although the present center is approaching 3 years of operation, its surgical team has had previously experience before working at this center and has not modified its technique.

In terms of weight loss alone, the patients in this study achieved levels comparable to published data in 2 sizable meta-analyses [7,24]. The mean weight loss at 12 months was  $50.6 \pm 16.8$  kg ( $60.3\% \pm 15.1\%$  excess weight loss) for all patients in this study, comparable to the pooled result of 43.46 kg from 32 RYGB studies (2937 patients) in the meta-analysis by Maggard et al [7] and the weighted mean of 47.06 kg from 22 gastric bypass studies (2742 patients) in the analysis by Buchwald et al [24].

The main limitation of our study was that the positive relationship between weight loss and support group attendance was merely associative, not causal. Prospective studies randomizing support group participation would better serve to examine its causal influence. Support group attendance likely influences weight loss indirectly by providing peer education, support, and relationships, rather than directly affecting the physiology of weight loss.

Another limitation applied to the support group attendance data, because attendance did not imply participation. Attendance served as a proxy for participation, especially in patient-directed roundtable discussion groups, but some patients might benefit more from support groups than others. The participations levels were purposefully not measured during the support group meetings in an effort to allow patients to feel at ease with no pressure to speak. Each support group averaged 15–20 participants. Our belief is that inherently small support groups allow for frequent participation and the opportunity for people to get to know each other closely. With that said, it would be feasible to measure participation by keeping track of the number of questions asked, questions answered, and general comments

Table 2  
Comparison of %EWL at 6 follow-up visits after RYGB

Follow-up	Group A (>5 SGMs; n = 28)	Group B (≤5 SGMs; n = 50)	P value
2 wk	10.52 (5.71–15.35)	11.33 (7.72–14.94)	.8
6 wk	21.37 (16.56–26.19)	21.75 (18.14–25.36)	.89
3 mo	30.91 (26.09–35.73)	31.75 (28.14–35.35)	.99
6 mo	44.44 (39.62–49.26)	41.32 (37.71–44.93)	.20
9 mo	53.63 (48.81–58.45)	45.16 (41.55–48.76)	.002
12 mo	55.49 (50.67–60.30)	47.05 (43.44–50.65)	.002

SGMs = support group meetings.

Data in parentheses are 95% confidence intervals.

made. Other methods might include documenting the general gauge of heavy, moderate, or light participation for patients at the end of each support group meeting.

A final limitation was the loss of data because of patients not coming to appointments or permanent loss to follow-up. However, we do not believe this affected the validity of our results, because the dropout was nondifferential and not associated with support group attendance ( $P > .20$ ). A nondifferential loss to follow-up would not bias the relationship between support group attendance and weight loss outcome.

## Conclusions

The results of this study have supported the use of support groups in helping patients achieve and maintain maximal weight loss. It also adds to the published data on weight loss after laparoscopic RYGB. Social support systems for patients might facilitate weight loss after surgery, but the mechanisms of how the social forces influence behavioral changes leading to weight loss need to be better understood. Future studies should also examine more closely the design and dynamics of support groups. Implementing regular support group meetings within the postoperative follow-up care could provide patients with the best chances of achieving maximal weight loss.

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## Disclosures

*The authors have no commercial associations that might be a conflict of interest in relation to this article.*

## References

- [1] Flegal KM, Carroll MD, Ogden CL, Johnson CL. Prevalence and trends in obesity among US adults, 1999–2000. *JAMA* 2002;288:1723–7.
- [2] Ogden CL, Flegal KM, Carroll MD, Johnson CL. Prevalence and trends in overweight among US children and adolescents, 1999–2000. *JAMA* 2002;288:1728–32.
- [3] Hedley AA, Ogden CL, Johnson CL, Carroll MD, Curtin LR, Flegal KM. Prevalence of overweight and obesity among US children, adolescents, and adults, 1999–2002. *JAMA* 2004;291:2847–50.
- [4] Fontaine KR, Redden DT, Wang C, Westfall AO, Allison DB. Years of life lost due to obesity. *JAMA* 2003;289:187–93.
- [5] Olshansky SJ, Passaro DJ, Hershow RC, et al. A potential decline in life expectancy in the United States in the 21st century. *N Engl J Med* 2005;352:1138–45.
- [6] Buchwald H, Williams SE. Bariatric surgery worldwide 2003. *Obes Surg* 2004;14:1157–64.
- [7] Maggard MA, Shugarman LR, Suttrop M, et al. Meta-analysis: surgical treatment of obesity. *Ann Intern Med* 2005;142:547–59.
- [8] Martin LF. *Obesity surgery*. New York: McGraw-Hill: 2004.
- [9] Farkas DT, Vemulapalli P, Haider A, Lopes JM, Gibbs KE, Teixeira JA. Laparoscopic Roux-en-Y gastric bypass is safe and effective in patients with a BMI  $\geq 60$ . *Obes Surg* 2005;15:486–93.
- [10] Papasavas PK, Gagne DJ, Kelly J, Caushaj PF. Laparoscopic Roux-en-Y gastric bypass is a safe and effective operation for the treatment of morbid obesity in patients older than 55 years. *Obes Surg* 2004;14:1056–61.
- [11] Schauer PR, Ikramuddin S, Gourash W, Ramanathan R, Luketich J. Outcomes after laparoscopic Roux-en-Y gastric bypass for morbid obesity. *Ann Surg* 2000;232:515–29.
- [12] Wittgrove AC, Clark GW. Laparoscopic gastric bypass, Roux-en-Y: 500 patients—techniques and results, with 3–60 month follow-up. *Obes Surg* 2000;10:233–9.
- [13] Nguyen NT, Goldman C, Rosenquist CJ, et al. Laparoscopic versus open gastric bypass: a randomized study of outcomes, quality of life, and costs. *Ann Surg* 2001;234:279–89.
- [14] Westling A, Gustavsson S. Laparoscopic vs open Roux-en-Y gastric bypass: a prospective, randomized trial. *Obes Surg* 2001;11:284–92.
- [15] Gliniski J, Wetzler S, Goodman E. The psychology of gastric bypass surgery. *Obes Surg* 2001;11:581–8.
- [16] Elakkary E, Elhorr A, Aziz F, Gazayerli MM, Silva YJ. Do support groups play a role in weight loss after laparoscopic adjustable gastric banding? *Obes Surg* 2006;16:331–4.
- [17] Hildebrandt SE. Effects of participation in bariatric support group after Roux-en-Y gastric bypass. *Obes Surg* 1998;8:535–42.
- [18] Van Hout GC, Verschure SK, van Heck GL. Psychosocial predictors of success following bariatric surgery. *Obes Surg* 2005;15:552–60.
- [19] Herpertz S, Kielmann R, Wolf AM, Hebebrand J, Senf W. Do psychosocial variables predict weight or mental health after obesity surgery? A systematic review. *Obes Res* 2004;12:1554–69.
- [20] Averbukh Y, Heshka S, El-Shoreya H, et al. Depression score predicts weight loss following Roux-en-Y gastric bypass. *Obes Surg* 2003;13:833–6.
- [21] Bocchieri LE, Meana M, Fisher BL. Perceived psychosocial outcomes of gastric bypass surgery: a qualitative study. *Obes Surg* 2002;12:781–8.
- [22] Jeng G, Renquist K, Doherty C, Mason EE. A study on predicting weight loss following surgical treatment for obesity. *Obes Surg* 1994;4:29–36.
- [23] Nguyen NT, Silver M, Robinson M, et al. Result of a national audit of bariatric surgery performed at academic centers. *Arch Surg* 2006;141:445–50.
- [24] Buchwald H, Avidor Y, Braunwald E, et al. Bariatric surgery: a systematic review and meta-analysis. *JAMA* 2004;292:1724–37.