

Gastric Bypass in Patients with BMI <40 but >32 Without Life-threatening Co-morbidities: Preliminary Report

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Background: Surgical intervention is currently indicated for patients with BMI >40 or >35 with life-threatening comorbidities. Patients with BMI 32-40 without these comorbidities not only have the increased propensity to develop them but also suffer from similar psychosocioeconomic consequences. These patients may not respond to non-surgical treatment of obesity any better than those with BMI >40. The question has been raised whether to offer them surgical intervention.

Methods: A study was carried out to determine outcome of surgery on patients with BMI >32 but <40 without life-threatening comorbidities but with either psychological, economic or social impairments affecting their quality of life. The approval of our Hospital Internal Review Board was obtained. In addition to routine evaluation for surgical intervention, these patients were required to have the approval of their primary care physician, be seen pre-operatively by a psychiatrist, and have a member of the family or a very close friend present at the time of discussion of operative risks and follow-up requirements. Patients committed to at least a 5-year follow-up. They were to be self-paying patients. The transected silastic ring vertical gastric bypass with a temporary gastrostomy was used.

Results: 50 patients, 49 women and one man, were entered into the study between May 1, 1999 and April 30, 2000. 50% were self-pay, and the other 50% were able to obtain coverage through their insurance companies. There were few peri-operative complica-

tions and no deaths. The late complications include incisional hernias, dumping and transient alopecia. Hospital stay averaged 3.7 days. Follow-up has been 18-27 months. Weight loss has been excellent.

Conclusion: Preliminary results of surgical intervention extended to patients with BMI 32-40 without life-threatening comorbidities but with psychosocioeconomic ramifications are very promising. Long term follow-up and comparison with other bariatric patients are planned.

Key words: Morbid obesity, obesity, bariatric surgery, criteria for surgery, quality of life

Introduction

Obesity is recalcitrant to non-surgical treatment.^{1,2} Currently the accepted indication for surgical treatment is body mass index (BMI) >40 or >35 with life-threatening co-morbidities such as diabetes, sleep apnea, hypertension, dyslipidemia, coronary heart disease, thromboembolic disease, venous stasis, gallbladder disease, pseudotumor cerebri and debilitating arthritis.^{3,4} Although the NIH Consensus Panel statement of 1991 included in its indications for surgical treatment, patients with less severe obesity without the life-threatening comorbidities but with limitations in quality of life, inability to perform activities of daily living and impairment in employability, there have been no reports of studies to evaluate the outcome of surgical treatment in patients who fall into this category.

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A clinical study was undertaken to determine the outcome of surgery in patients with BMI >32 but <40 without overt life-threatening co-morbid conditions but with the psychological, social and economic consequences affecting their quality of life, activities of daily living and employability.

Method

Approval by the hospital Internal Review Board was obtained for the study, after documentation that patients with BMI 32 to 40 without life-threatening co-morbid conditions suffer psychological, social and economic consequences similar to those with a BMI >40 or those with a BMI >35 with co-morbid conditions. Documentation was also provided of the high recidivism rate of non-surgical treatment in this group of patients. Finally, it was documented that surgical treatment by gastric bypass (GBP) can be as effective in treating patients with BMI 32 to 39.9 as in patients with BMI >40 with comparable morbidity. Fifty patients who were seeking surgical intervention for obesity were entered into the study. These patients underwent the same pre-operative evaluation as the other patients for GBP. This usually included chest X-ray, upper gastrointestinal series, gallbladder ultrasound, pelvic ultrasound in females, endocrine, liver and kidney profiles and pre-operative clearance by both a cardiologist and a pulmonologist (Table 1).

Table 1. Routine and pre-operative evaluation and commitment by patients treated with GBP

Complete history and physical examination
Ability to understand the ramifications of surgical treatment of obesity
Blood chemistries
X-rays: Chest, UGI, Abdominal and Pelvic Ultrasound
EKG
Pulmonary and cardiology clearance
Other consultations if necessary for co-morbid conditions
Pre-operative attendance at support group meeting
Commitment to attend support group meetings after surgery
Commitment to life-long intake of nutritional supplements
Commitment to life-long medical monitoring and follow-up

Patients for this study were required to have approval by their primary care physicians. They were evaluated by a psychiatrist and had a member of the family or a very close friend present at the time of discussion of the operative risks, nutrient requirements and follow-up requirements. They were required to commit to 5 years follow-up at our Center in addition to life-long medical monitoring. Initially, the patients were required to be self-paying, but some were able to get third party coverage to pay for the operation and follow-up, once co-morbidities were diagnosed on pre-operative screening or intra-operatively. The transected silastic ring vertical gastric bypass (TSRVGBP) with a temporary gastrostomy and a gastrostomy site marker was performed in all patients^{5,6} (Figure 1). Routine cholecystectomy was performed in patients with a gallbladder, and other surgical procedures as indicated were performed concurrently. Data was collected prospectively.

Results

Fifty patients (49 women, one man) with BMI <40 but >32 who had no obvious co-morbid condition were entered into the study between May 1, 1999 and April 30, 2000 (Table 2). All patients had tried and been unsuccessful in losing and maintaining weight loss. These patients had voluntarily come to the Center and requested surgical intervention as a

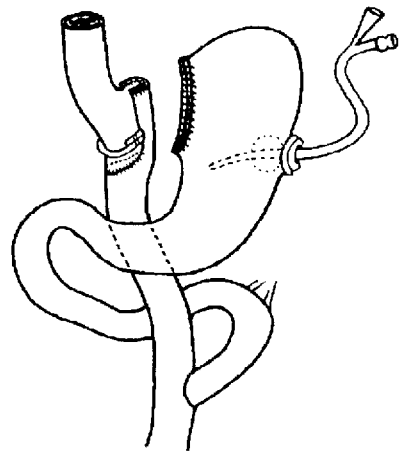


Figure 1. Transected silastic ring vertical gastric bypass (TSRVGBP), with jejunal interposition, temporary gastrostomy and gastrostomy-site marker.

Table 2. Patient characteristics

No. of Patients	50 (100%)	
Sex	Female	49 (98%)
	Male	1 (2%)
Race	White	41 (82%)
	Black	7 (14%)
	Hispanic	1 (2%)
	Asian	1 (2%)
Payment	Private insurance	25 (50%)
	Self-pay	25 (50%)
Age (yr)	41.72±10.78*	(17-62)**
Height (cm)	165.15±10.78	(149.86-182.88)
Initial weight (kg)	104.61±9.83	(76.73-133.02)
BMI (kg/m ²)	37.89±2.16	(32.08-39.99)
Excess weight (kg)	42.48±7.70	(23.61-62.65)
%Ideal weight	169.28±10.84	(144.44-189.03)

*Mean±SD

**Range

last resort. All the patients cited psychological, social and economic limitations as the reasons that they were requesting surgical intervention (Table 3). Co-morbid conditions detected in these patients included hyperglycemia, hyperlipidemia, cholelithiasis, and sleep disorders (Table 4). Concurrent operations in this series included 29 cholecystectomies, 23 panniculectomies, 2 tubal ligation and 1 appendectomy (Table 5). Five

Table 3. Psychosocioeconomic consequences listed by patients with BMI>32 but <40

Social	
Failure to loss and maintain weight loss	
Social isolation	
Daily encounterance with prejudice:	
	- verbal abuse
	- physical abuse
	- sexual abuse
Limitation in activities of daily living	
Difficulty with hygiene	
Clothing limitations	
Limited access to chairs, seats and passage ways	
Limitation in walking, climbing stairs	
Sexual limitations	
Economic	
Cost of futile weight loss treatment	
Cost of treating medical conditions	
Inability to obtain insurance coverage, or increased premium	
Cost of special clothing	
Difficulty obtaining good jobs or promotions	
Psychologic	
Depression	
Insomnia	
Suicide	
Neurotic disorders	
Self-hate and feeling of guilt	

Table 4. Co-morbid conditions

Co-morbid Conditions	All Patients		On Medications	
	n	%	n	%
Physical limitations	49	98	-	-
Dyspnea on exertion	48	96	-	-
Joint disorders	38	76	7	14
Depression	37	74	16	32
Discogenic disorders	34	68	15	30
Heartburn	34	68	15	30
Sleep apnea	28	56	0	-
Gallbladder disease	26	52	-	-
Hypertension	13	26	6	12
Hyperlipidemia	10	20	6	12
Hypothyroidism	10	20	6	12
Hemorrhoids	9	18	-	-
Insomnia	7	14	1	2
Irregular menstruation	7	14	-	-
Asthma	6	12	6	12
Headaches	4	8	-	-
Diabetes/				
Hyperglycemia	2	4	1	2
Anxiety disorder	2	4	2	4

patients were found to have cholelithiasis preoperatively, and another 10 patients were found to have pathologic gallbladders. Average age was 41.7, average BMI 37.9, and average height 165 cm.

Average hospital stay was 3.7 days. The peri-operative complications included two splenectomies, wound problems in two of the 29 patients who had a panniculectomy, transient nausea and dyspepsia and deep venous thrombosis in two patients (Table 6). There were no pulmonary

Table 5. Concurrent surgeries

Concurrent surgery*	n	%
Cholecystectomy	29	58
Panniculectomy	23	46
Bilateral tubal ligation	2	4
Splenectomy	2	4
Appendectomy	1	2
Total	57	

*Concurrent surgeries in 41 patients (82%)

Table 6. Peri-operative complications

Peri-operative complications*	n	%
Wound dehiscence	2	4
Post-operative bleeding	2	4
Splenectomy	1	2
Deep vein thrombosis	1	2
Nausea	1	2
Total no. of complications	7	

*Peri-operative complications in 5 patients (10%)

emboli, leaks or deaths.

Late complications include four incisional hernias, occasional dumping, hypoglycemic attacks, transient anorexia and alopecia (Table 7). None of the patients has required a revision of the operation. All are taking vitamin, calcium and iron supplements. Yearly blood chemistries have been evaluated either by us or their primary care doctor. At 1 year the blood chemistries have been normal.

Follow-up has been 100% at 3 and 6 months, 94% at 12 and 18 months, 93% at 24 months, and 94% at 27 months (Table 8). Average percent excess weight loss has been 51.6, 72.5, 88.4, 94.7, 93.6 and 95.0 % at 3, 6, 12, 18, 24 and 27 months respectively (Table 9). Average BMI was 37.9 pre-operatively, and 30.0, 26.8, 24.4, 23.4, 24.6, and 23.4 at 3, 6, 12, 18, 24 and 27 months respectively (Table 10). These are the most motivated, appreciative and compliant patients in our practice.

Discussion

Obese individuals have a high propensity to develop co-morbid conditions.⁷ Obesity impairs quality of life, ability to perform normal activities of daily living and ability to be gainfully employed.^{8,9} Obesity is the last bastion of overt prejudice in our society. Most of the patients who seek surgical intervention do so because of the psychological, social and economic consequences of the obesity. To most of the patients, the life-threatening co-morbid conditions are significant but not as important as the associated psychosocioeconomic problems. The patients with BMI <40 but >32 in this study sought surgical treatment for the same reasons as patients with morbid obesity, because of psychosocioeconomic consequences.

These psychological, economic and social problems of obesity were recognized by the NIH Consensus Panel when they issued their statement on gastrointestinal surgery for obesity in 1991: "In certain instances, less severely obese patients (with BMI between 35 and 40) also may be considered

Table 7. Late complications

	n	(%)
Ventral Hernia	4	8

Table 8. Percent follow-up

Months	Eligible n	Followed n	%
3	50	50	100
6	50	50	100
12	50	47	94
18	50	47	94
24	41	38	93
27	16	15	94

for surgery. Included in this category are patients with high-risk co-morbid conditions such as life-threatening cardiopulmonary problems (e.g. severe sleep apnea, Pickwickian syndrome, and obesity-related cardiomyopathy) or severe diabetes mellitus. Other possible indications for patients with BMIs between 35 and 40 include obesity-induced physical problems interfering with lifestyle (e.g. joint disease treatable but for the obesity, or body size problems precluding or severely interfering with employment, family function, and ambulation)".⁴

Surgical intervention which has been shown to have a longer lasting effect than non-surgical treatment for morbid obesity, is increasingly being accepted and performed. Initially, surgery was only indicated in individuals who were twice their ideal weight based on the Metropolitan Tables,^{1,2} partly because of the inherent risks and the unknown long-term effects of surgeries. As operations have been made safer, the indications for surgical inter-

Table 9. Percent excess weight loss (%EWL)

Months post-op	%EWL	±SD
3	51.56	13.29
6	72.51	15.17
12	88.41	14.65
18	94.70	15.47
24	93.64	14.99
27	94.99	14.75

Table 10. Body mass index (BMI) kg/m²

Months after operation	BMI	±SD
Initial BMI	37.89	2.16
3	30.04	2.52
6	26.80	2.48
12	24.35	2.31
18	23.38	2.37
24	24.56	2.17
27	23.41	2.28

vention have become less stringent. Currently, surgical intervention is justified for persons with BMI >40 or >35 with life-threatening co-morbid conditions.⁴ Individuals with BMI >30 but <40 without overt life-threatening co-morbid conditions are usually advised to seek non-surgical treatment, which has a high recidivism rate which leads to further psychological and economic consequences.^{8,9}

From 1977 to the present, we have performed approximately 6,000 GBP. Since 1991, about 3,000 of these were TSRVGBP, of which 22 had a BMI ≤35 (0.7%).

In the present prospective study of the 50 patients, the preliminary results appear to favor treating this subgroup surgically. These patients have more underlying co-morbidities than are apparent. They pose less risks and have fewer surgical complications. They are not severely traumatized by their obesity medically and can adjust to society more easily than those with a higher BMI before surgery. Long-term side-effects of GBP such as osteoporosis, anemia, and nutrient deficiencies must be monitored to see if the resultant weight loss is deserving of these side-effects in this moderately obese group. Long-term monitoring and reporting will be forthcoming.

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