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Gastroplasty for Morbid Obesity: Effect on Morbidity and Quality of Life

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Abstract

54 patients underwent Mason vertical banded gastroplasty over 3 years. 12 patients were superobese, 32 morbidly obese and 10 with medical significant obesity. Operative treatment results in a reduction of 85.5% of ideal weight (38.5% of their original weight and 70.14% of their excess weight) after 2 years in 53.7% of patients. A typical indication is in a patient above 160% of his ideal weight (Body Mass Index more than 35 Kgm/m^2), aged between 18 - 60 years, has musculine fat distribution and got an obesity related disease with impairment of life quality. The constricting band and pouch size should not be greater than 5 cm and 20 ml respectively. Double staple line with reinforcement is essential to avoid suture line dehisence. Post-gatroplasty special diet should be followed. No mortality recorded and all complications treated conservatively except 2 and they entail hypoventilation (2 cases), chest infection (4 cases), wound infection (4 cases), wound seroma (4 cases), stomal stenosis (3 cases), nutritional problem (1 case), reflux oesophagitis (3 cases) and weight regain (4 cases). Co-morbid conditions (obesity related disease) entails arthritis (38 cases), hypertension (19 cases), diabetes (12 cases), hyperlipidaemia (11 cases), asthmatic bronchitis (9 cases), angina/CHF (4 cases) and sleep apnea (1 case). The improvement of co-morbidity with surgically induced weight loss is impressive. The percentage of either resolution or improvement is documented. Finally the effect on the quality of life has been studied using the Sickness Impact Profile and total dysfunction score has improved from 22.3% pre-operatively to 8.7% postoperatively. To date, surgical methods are the only viable method to achieve weight loss in dangerously obese patients and gastroplasty is a safe and effective procedure to achieve this.

Introduction

MORBID obesity is an extremely distressful state. In a questionnaire, all patients said they would rather be normal weigh than a morbidly obese multimillionare [1].

Hypertension, Pickwickian syndrome, hyperlipidaemia, osteoarthritis, atherosclerosis and diabetes are major risk factors in patients who are morbidly obese [2,3,4].

These problems contribute to a shortened life span [5,6] Also the quality of life is poor in obese people because of the poor physical health and mental well-being [7].

Few morbidly obese patients can reduce their weight and maintain this by dieting and behavior modification [8]. Gastric balloon has been assessed as ineffective [9]. Although jejunal bypass effectively reduces weight but the patients are at contineous risk of many complications [10].

Gastric reduction procedures have been shown to produce impressive short-term results in treatment of morbid obesity with less complications [11].

The original horizontal gastroplasties were unsuccessful but more mordern operations such as vertical banded gastroplasty produce good weight loss with improvement in health.

The aim of this work is to present our experience with this antiobesity procedure: the criteria for patients selection, the efficacy of operation in reducing and maintaining weight loss, the surgical complications and the effects on obesity related diseases and quality of life.

Patients and methods

Between January 1998 and January 1991, 54 patients underwent vertical banded gastroplasty as an antiobesity procedure. 29 were males and 25 were females. The age ranged between 19 to 54 years. The age, sex and marrital state of our patients are shown in table (1).

Table (1) : General Characteristics for the Patients.

	No.	Percentage
Sex :		
Male	29	53.7
Female	25	46.3
Marrital state:		
Single	23	42.6
Married	31	57.4
Age:		
< 20	3	5.6
20 - 30	27	50
30 - 40	17	31.5
40 - 50	5	9.2
50 +	2	3.7

Accurate measurement of height and weight was the initial step in the clinical assessment of our patients.

Overweight is defined in relation to tables of desirable weight that generally have been prepared from insurance company information. Desirable weights are those associated with the most favourable mortality experience. The degree of "overweight" can be expressed either in the percentage of ideal weight or the body mass index (BMI); the body weight (Kgm) divided by the height in (m) squared (weight/height^2). The BMI is correlated with body fat and is relatively inaffected by height. Overweight is defined as a BMI between 25-30 Kgm/mm^2 and obesity when BMI is above 30 Kgm/mm^2. Table 2 demonstrates obesity classification in relation to percentage of ideal weight and BMI.

The patients were considered for surgery if their weight exceeded 160% of the ideal or desirable weight (the most appropriate standard for ideal weight presently is the 1983 table of the Metropolitan Life Insurance Company) or body mass index more than 35 Kgm/m^2.

The patients should have attempted unsuccessfully, over a long time, non surgical program, with integrated components of dietary regimen, appropriate excercise and behavioural modification.

The age of the patients should be over 18 years and less than 60 years old. The patients were well informed about the procedure, expectations and possible complications and allowed to contact those patients who had the procedure before, and to know from them their expectations before surgery and the reality after.

Table (2) : Obesity Classification in Relation to Percentage of Ideal Weight and Body Mass Index (BMI).

	Men		Women	
	% Ideal Weight	BMI	% Ideal Weight	BMI
Super obese	225	60	245	> 50
Morbidly obese	200	45	220	45
Medically significantly obese.	160	35	170	35
Obese	135	30	115	30
Ideal weight	100	22	100	21

All patients underwent routine invesitigations including full blood picture, fasting and random blood sugars, serum lipids (serum cholesterol, high density lipoproteins and triglycerides), liver function tests, blood chemistry, ECG, chest X ray, abdominal ultra-sound and comprehensive pulmonary function tests including arterial blood gas levels. All the patients were fully examined and evaluated before surgery by multidisciplinary team including medical, psychiatric, nutritional and surgical expertise.

Special interest was given to the comorbid conditions including hypertension, arthritis, diabetes, hyperlipidaemia, asthmatic bronchitis, angina, congestive heart failure (CHF), deep venous thrombosis and sleep apnea. Also the quality of life is assessed using some parameters of the "Sickness Impact Profile" introduced by Bergner [12] and used in psychological evaluation of many diseases. The parameters used are the social interaction, work status, emotional behaviour, recreation and pastimes, sleep and rest, ambulation, and eating.

S.C heparin and I.V Ranitidine were given with premedications. 2 gm Cefazolin were given I.V with induction of anaesthesia to provide adequate tissue levels in these morbidly obese patients. The procedure was conducted as described by Mason [13]. Fig. (1).

Certain points we considered important for early and late success of the procedure,

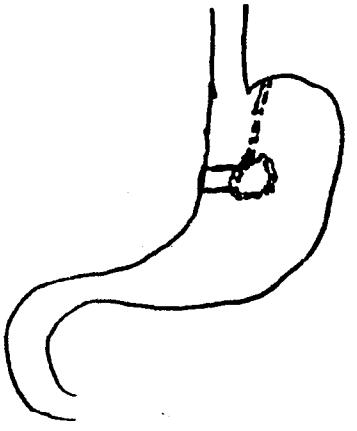

Fig. (1)

that is pouch size should be around 10-20 ml and the Gore-tex band should not be more than 5 cm in circumference. The stapler should apply 2 raws of staples on both sides and re-inforcement of the stapled lines of both the EEA and TA_{55} by proline continuous stitches to guard against leakage and staple line dehiscence.

Post-operatively, the patients were nursed in semi-sitting position after extubation. Chest physiotherapy started the first post-operative day. Also S.C heparin and I.V Ranitidine continued till patient's discharge. If blood gases showed only abnormality after extubation, the patient would be ventilated overnight in the intensive care and extubated the second day. Early ambulation was encouraged. Barium meal was done after 4 weeks to assess the size of the pouch and its outlet. Fluid diet was started the second day and advanced to blenderized diet over few days. Calorie

intake should be sufficient to have a rather safe weight loss. After 2 months solids were introduced and the patient was advised for the gastroplasty diet.

Patients are followed up at 2.6 weeks after the operation then every 3 months for 2 years, thereafter every 6 months. The results of this antiobesity surgery was expressed by tabulating weight loss and also the changes which occurred in the co-morbid conditions. These medical problems were considered resolved when medications no longer were needed and improved when controlled on reduced doses of medications. Finally the quality of life had been evaluated, although difficult, by asking the patient to answer again the questions of the chosen parameters of the sickness Impact Profile.

Table (3) : The Gastroplasty Diet .

Avoid	Select
Soft calorie- dense foods:	Bulk:
Ice cream	Raw vegetables
Chocolate	High prote foods
Cheese	Supplements
Easily dissolvable foods:	Iron
Cookies	Calcium
Cake	Vitamins
High Calorie liquids:	Low calorie liquids:
Alcohol	Skim milk
Sodas	Diet sodas
Foods causing obstruction	Rules of eating
Red meat	Chew carefully
Soft bread	Eat undisturbed
Pasta	Never drink after solids
Citrus "membranes"	

Statistical Analysis :

The mean percent ideal weight and body mass index were compared for each obesity status by using *t*-test. Excess body weight was not normally distributed, so Wilcoxcon Ranksum W test along with Mann Whitney U test (non-parametric tests) used to compare those who lost 50% of their excess weight with those who did not. Significant levels for all analysis was chosen to be < 0.05.

Results

All the 54 patients were followed up to 3 months. After 6 months 4 patients resident in other cities were lost for follow up. Those who followed up for 12 months were 46, 18 months were 34 and 24 months were 29.

The mean pre-operative weight in males was 145.5 ± 14.32 Kgm and in females was 132.36± 13.84, BMI was 48.93 ± 5.23 for males and it was 49.86 ± 7.45 in females and the percentage ideal weight was 213.66 ± 23.19 for males and 231.31 ± 28.42 for females Table (5,6) showed a comparison of percentage ideal weight and

BMI, before surgery and 6 months, 12 months, 18 months and 24 months after surgery for those who attended the follow up.

There were no early or late deaths in this study. Also there were no gastric bleeding or leak.

Wound infection occurred in 4 patients (7.4%). Staphylococci was isolated from 2 and pseudomonas from 1 case and mixed growth in the fourth. The patients were treated by early removal of the sutures and antibiotics.

Wound seroma was detected in another 4 patients which responded well to drainage and prophylactic antibiotics.

Hypoventilation with change in blood gases occurred in 2 patients. Chest X ray showed mild atelectasis in one of them. These patients were ventilated for 48 hours.

Four patients had chest infection with purulent discharge treated by antibiotics, chest physiotherapy and in none of them ventilation was required. Stomal stenosis occurred in 3 cases 2 after 3 months and one after 1 year. All the 3 patients responded well to endoscopic dilatation. One patient who had serious social problems at home, did not get proper nutritional care; so he developed severe muscular weakness and difficulty in walking. He was re-admitted to the hospital to be under proper nutritional supervision. His general condition improved, discharged home after 2 months.

Reflux oesophagitis occurred in 3 cases. 2 cases responded well to conservative management but in one severe case which

Table (4): Weight Prior to Vertical Banded Gastroplasty in Relation to Sex .

	% Ideal weight	BMI	Absolute weight (Kgm)
Male			
N=29 mean	213 . 66	48 . 93	145 . 5
S. D.	23 . 19	5.23	14 . 32
Female			
N = 25 mean	231 . 31	49 . 86	132 . 36
S. D	28 . 42	7.45	13 . 84

S.D. = Standard deviation.

Table (5) : Comparison of % Ideal Weight and BMI Before and 6,12,18,24 (Months) after Surgery

	Before surgery			6 months after surgery			12 months after surgery			18 months after surgery			24 months after surgery		
	No.	%ideal weight	BMI	No.	%ideal weight	BMI	No.	%ideal weight	BMI	No.	%ideal weight	BMI	No.	%ideal weight	BMI
Superobese	12	253.37	56.29	11	209.3	46.48	10	189.2	42	7	180.4	40.1	6	183.3	40.7
Morbid obese	32	218.8	48.6	29	173.7	38.58	27	157.6	35	22	144.8	32.16	18	138.2	30.7
Medical signi ficant obesity	10	194.4	43.7	10	149.8	33.67	7	136.5	30.68	3	132.3	29.74	3	122.5	72.45
Total	54	221.937	49.4	50	176.752	39.335	46	154.407	34.343	34	142.509	31.689	29	136.376	30.316
				92.6%			85%			63%			53.7%		

failed to respond to conservative measures, re-operation with Roux en Y gastric by-pass.

Vomiting used to occur when the patient did not stick to the gastroplasty diet (Table 3) especially with meat and it used to resolve when it had been well followed.

4 patients (3 superobese, 1 morbidly obese) started to regain weight after 18 month from surgery. One of them was re-operated by modified type of intestinal by-pass. The patient was very insisting to be re-operated

Effects on the Co-morbidity:

94 medical problems (obesity related disease) were identified in 43 patients of the whole series of 54 patients preoperatively; arthritis (38 cases), hypertension (19 cases), diabetes (12 cases), hyperlipidaemia (11 cases), asthmatic bronchitis (9 cases), angina and congestive heart failure (4 cases) and sleep apnea (1 case).

All the 54 patients were available for re-evaluation after 6 weeks but only 50 attended the follow up after 6 months. Only 2 of the lost 4 cases from the follow up at 6 months had got medical problems which had showed improvement after 6 weeks.

Table 8 shows the improvement of co-morbidity with surgically induced weight loss.

Effect on the Quality of Life:

The results of 7 parameters of the sickness impact profile are shown in table (9). They were checked preoperatively (54 patients) and 1 year post operatively (46 patients). The parameters chosen are social interaction, work status, emotional behaviour, recreation and pastimes, ambulation, sleep and rest, and eating. A total dysfunction score was 22.3% pre-operatively and 8.7% (year post-operatively).

Table (6) : Comparison of % Ideal Weight and BMI before and 6,12,18,24 Months after Surgery.

Time	No. of patients followed up	% ideal weight	BMI
Before surgery	54	221.937	49.4
6 months after	50 (92.6%)	176.752	39.336
12 months after	46 (85%)	154.407	34.343
18 months after	34 (63%)	142.509	31.689
24 months after	29 (53.7%)	136.376	30.316

The numbers in parentheses are percentages of follow up rate .

Table (7) : Post - operative Complications of Gastroplasty .

Complication	No.	%	Management
Early			
- Hypoventilation	2	3.7	Ventilation chest
- Chest infection	4	7.4	Physiotherapy+antibiotics
- Wound infection	4	7.4	Drainage+ antibiotics
- Wound seroma	4	7.4	Drainage+ antibiotics
Late :			
- Stomal stenosis	3	5.6	Endoscopic dilatation
- Nutritonal	1	1.85	Hospitalization and nutritional supervision.
- Reflux oesophagitis	3	5.6	2 conservative treatment with antiacids & H_2 blockers & 1 sur.
- Weight regain in 2 yrs	4	7.4	One had modif. type of intestinal bypass

Table (8) : Improvment of Co-morbidity with Surgically Induced Weight Loss .

Problem	No. of patients & %*.	Resolved**	Improved**	Uncharged**
Arthritis	38 (70.37)	16 (42.1%)	19 (50%)	3 (7.9%)
Hypertension	19 (35.19%)	10 (52.6%)	8 (42.1%)	1 (5.3%)
Diabetes	12 (22.2%)	8 (66.7%)	3 (25%)	1 (8.3%)
Hyperlipidaemia	11 (20.37%)	7 (63.6%)	3 (27.3%)	1 (9.1%)
Asthnatic bronchitis	9 (16.6%)	6 (66.7%)	3 (33.3%)	0
Angina/CHF	4 (7.4%)	3 (75.7%)	1 (25%)	0
Sleep apnea	1 (1.85%)	1 (100%)	0	0

* Numbers in parentheses in this column are percentages of the entire series of 54 patients .
** Numbers in parentheses in this column are percentages of the cases affected by the disease .

Table (9) : Quality of Life Data Improvement .

Paramenter	No. of patients showing abnormality and %	
	Before gastro plasty No . 54	1 year after surgery No .46.
1 . Social interaction	18 (30%)	4 (8.7%)
2 . Work status	9 (15%)	4 (8.7%)
3 . Emotional behaviour	12 (22.2%)	4 (8.7%)
4 . Recreation & Pastimes	22 (40.7%)	6 (13%)
5 . Ambulation	13 (24%)	4 (8.7%)
6 . Sleep & rest	12 (22.2%)	5 (10.7%)
7 . Eating	1 (1.85%)	1 (2.2%)
Total dysfunction score in chosen parameters	22.3%	8.7%

Discussion

The surgical approaches to treat obesity initially used methods observed to cause weight loss as a side effect when treating other conditions. Intestinal bypass was an outgrowth of small bowel resections for inflammatory bowel disease or vascular compromise. Gastric bypass was modeled on the resections performed for cancer or ulcer disease.

The first documented surgical procedure for obesity was extensive small bowel reseetion [14]. In the early era of antiobesity surgery, in the early and mid-1960s, when intestinal resections and bypass were done extensively it seems little attension was paid to the potential adverse effects of the surgery. Awareness of side effects of classic intestinal bypass which include hypokalaemia, hypomagnesaemia, malnutrition, diarrhoea, cirrhosis, nephrolithiasis, arthritis, pathological fractures, perianal disorders, cholelithiasis, severe flatulence, intestinal tuberculosis and deficiency of vitamin B_{12}, iron and folate [10, 15, 16, 17] has increased. At that time in early 1980s the problem of morbid obesity was considered "no win" choice between hazardous disease and hazardous treatments such as very low calorie diets or surgery [18]. Also, it was obvious that non-

operative techniques are ineffective whether they are diets, behaviour modifications, intragastric balloons or combinations there of [19]. At the same time, greatly improved peri-operative management has made the performance of bariatric surgery much less hazardous [20]. This has prompted the continuing search for new surgical techniques.

The creation of a small proximal gastric pouch has been shown to be an effective method of weight reduction. A horizontally stapled pouch with a central or lateral gastrogastrostomy drainage stoma of 10 mm was developed [21]. Within short time it was apparent that weight loss was unsatisfactory in the majority and the method was abandoned. The failure related distension of an overlarge pouch. Mason in 1982 developed vertical banded gastroplasty [22].

On anatomic-physiologic principles, gastroplasty relies exclusively on physical restriction of the amount of solid food that can be ingested over time, on the other hand on psychological principle gastroplasty is behavioural surgery, it would function either by allowing smaller quantities of solid food to elicit gastric satiety or by causing mimiety through nausea or discomfort elicited by (over) distension of the upper stomach pouch or lower oesophagus [23]. There is no long-term information available on the pouch size after 5-10 years. The very small initial pouch size of 10-20 ml provides a long time lag before any expansion takes place, by that time it is hoped that diet and eating habit modifications should be firmly established [11].

Our criteria of patients selection entails patients who exceed 160% of their ideal weight or BMI of 35 Kgm/m^2. Mortality statistics unequivocally demonstrate a substantially increased risk of premature death at this weight level [24, 25]. Obesity also at this level has been shown to be an independent risk factor for coronary heart disease [26], and to be associated with numerous other serious diseases [27]. It is true that excess mortality and prevalence of co-morbid conditions increase exponentially with increasing weight, but it is conceivable that certain individuals with a predominantly gluteal (or female) distribution of fat or with family history of longivity inspite of "morbid" obesity are exempted from these statistical risks. So, in patients with such "protective" factors, our indication for surgical treatment was discretionary and based on impaired quality of life. We refused to operate on 3 patients under this category inspite of the absolute figure of increase in BMI. Also we consider that, good candidates for antiobesity surgery are patients with serious conditions (or at great risk to develop them) proven to be ameliorated by weight loss and who are unable to maintain adequate weight loss by other means. We did not operate on patients before 18 years or after 60 years old. As is the case with all surgery, every effort should be made to ensure that the patient is in optimal condi

tion to undergo surgery, taking into consideration the risk of postponing or not treating the patient surgically. Although the procedure we adopted is that of Mason vertical banded gastroplasty technique [22], yet the modifications described before are necessary for its success. These include accurate measurement of pouch size. Double staple line partitioning minimizes the risk of staple line dehiscence [28] and the double cartridge instrument is recommended [29]. Serosal reinforcement of the circular staple window in the stomach is recommended to minimize leakage [11] (nil in this series). Mason has confirmed that 5.5 cm bands will eventually fail [13]. We now fashion a 4.74 cm band as the risk of stenosis is higher when the band is made tighter.

The most common complication of the operation in hospital is early vomiting caused by a rushed intake; it rapidly resolves if intake is restricted for 24 hours. Although we had a sort of complications in 46.3% of our patient, yet none of them can be described as intractable and all except 2 have been managed without reoperation. We encountered wound infection in 4 cases (7.4%). This is comparable to the findings of Forse et al. [30] at Mc Gill University in Montreal, Canada, who reported wound infection at a rate of 16.5% in this operation compared with a rate of 2.5% in normal-weight patients who underwent clean-contaminated surgery. Both groups received 1 gm of cefazolin intramuscularly before surgery. When cefazolin increased to 2 gm, the wound infection rate dropped to 5.6% and the tissue and blood levels of antibiotic were within the minimal inhibitory concentrations. They concluded that antibiotic prophylaxis must be specially tailored to the needs of these obese patients.

2 patients with [3] respiratory insufficiency post-operatively needed ventilatory support for 48 hours, one of them had sleep apnea syndrome before surgery.

Sugerman et al. [3] reported operative mortality of 2.4% in these obese patients with respiratory insufficiency before gastric bypass surgery compared with 2% for obese patients without pre-operative respiratory problem.

The number of wound seroma in our series (7.4%) is much less than that reported by Owen et al. (40%) [11].

The incidence of stomal stenosis is reported to be in the region of 20% [31]. Endoscopic dilatation for postgastroplasty strictures is a useful and effective technique. It succeeded in our 3 cases (5.6%), obviating the need for operative revision. However, when the stenosis is associated with channel angulation, dilatation is almost uniformly unsuccessful. Such patients should not be subjected to repeated dilatation but rather proceed promptly to revision surgery [32].

We had to re-operate in one of our 3 cases with reflux oesophagitis by Roux en-Y gastric bypass. The operation prevented

acid and peptic reflux and maintained the weight reducing anatomy. Kim and Starr reported incidence of reflux in 38% in their patients but rarely re-operation is required [33].

Our patients lost 85.5% of their ideal weight after 2 years with a follow up rate of 53.7% (table 6), this makes loss equal to 38.5% of their original weight and 70.14% of their excess weight.

Six-year follow up of 139 patients with vertical banded gastroplasty in a combined series from 2 centres reveals a mean lose of 27% of preoperative weight or 53% of excess weight [34].

Freeman has suggested that every patient lost to follow up [35] be considered a total failure of weight loss. This "hard" failure rate in his experience (48 of 56 patients followed form 12 to 30 months after gastroplasty) was 48%. In our series after 18 months (chosen as medium time) 20 were lost from follow up and 4 failed to lose weight in whom one was re-operated. Our "hard" failure rate of 44.4% is comparable to that of Freeman.

We observed that the weight loss in the superobese group (those with % ideal weight of more than 225 table 2) is only 27.6% of their original weight and 45.7% of their excess weight compared with 38.5% and 70.14% respectively of the whole group. So the sickest patients (that is, the heaviest), lost less. It is reasonable to expect that precisely these, the heaviest patients, have the greatest problem controlling their eating. Although unproven, these patients probably are the ones least likely to co-operate with the follow up [36].

In our series 6 out of 12 patients of this group have been lost from follow up and 3 of the remaining 6 started to regain weight after 24 months. Thus a further dilemma presents itself. The patients most needy of operation may be disqualified from surgery if the surgeon adheres to the criterion of requiring full cooperation from the patient [37].

The list of co-morbid conditions in obesity is long. Among the most prevelent of the serious conditions are diabetes, hypertension and dyslipoproteinaemia. We encountered 12 (22.2%), 19 (35.19%), 11 (20.37) respectively of these cases. Sleep-apnea syndrome pseudotumour cerebri, and thromboembolism predispose to the increased incidence of sudden death seen in morbid obesity, but these conditions are not as common as hypertension and diabetes (encountered in only one patient of our series).

The most dramatic effect of anti-obesity surgery is the reduction of serious co-morbidity [38]. Improved glucose tolerance was recognised early in the history of antiobesity surgery and both gastroplasty and intestinal bypass have been shown to increase insulin sensitivity [39, 40, 41].

Indeed, most of our diabetic patients (66.6%) virtually are cured of their diabetes. The rest, except for only one, pa-

tient had shown marked improvement, even before they have had substantial weight loss. This is similar to the finding of Brolin [42] (14 patients out of 21 completely cured and the remaining 7 improved). Several studies have documented normalization of hypertension after surgically induced weight loss [2,42,43,44]. Nineteen (35%) of our patients were hypertensive. Of these 19 hypertensive patients 94.7% had resolved (52.6%) or improved (42.1%) during follow up for 6 months. Similarly, 95 of 210 patients who underwent surgery by Flickinger et al. [44], were hypertensive pre-operatively, 74% of them were on medications. Only 3 of 95 patients were hypertensive postoperatively.

Dyslipoproteinaemia in the form of elevated triglycerides and LDL-cholesterol, with concomitant reduced HDL-cholesterol, responded to weight loss achieved by any means. Intestinal bypass has been employed as a method to treat hypercholesterolaemia [45] in a long-term prospective trial to influence coronary heart disease morbidity and mortality [46]. Gastroplasty also has been shown to correct dyslipoproteinaemia [4] with the effect lasting over 5 years.

It is clear that the obese suffer from discrimination [7]. Absence of this reflects adaptation to chronic disease or failure of assessment instruments to detect disturbances. In spite of the strong proclivity for people to evaluate their own worst handicap as less disabling than other handicaps, patients said they would prefer to be normal weight with major handicaps (deaf, dyslexic, very bad acne, heart disease, one leg amputated) than to be morbidly obese [1]. So it is not surprising that most studies reveal improvements in psychosocial adaptation after surgically induced weight loss [8.47]. In our assessment of quality of life using the Sickness Impact Profile we found significant impairment in these patients with a mean dysfunction score of 22.3%. This score is of meaning when it is compared with that of other diseases described in the literature, for example, cirhosis, 20%; Crohn's disease 15%; status post-myocardial infarction 10%. The leading parameters with respect to dysfunction were recreation pastimes (40.7%) social interaction (30%) and ambulation (24%). After weigh loss, there were statistically significant improvements in all parameters with a mean postoperative dysfunction score of 8.7%. Interestingly, only 1 patient reported dysfunction in the eating parameter.

The most compelling argument for surgeons performing antiobesity surgery is the extraordinary gratitude of obese patients, even in the face of moderate weight loss or occasionally severe complications. This fact alone attests to the suffering and impaired quality of life endured by the morbidly obese.

Finally, despite numerous short comings and limitations, surgical methods are

the only viable alternative for achieving and maintaining substantial weight loss in dangerously obese patients and, therefore, represent a legitimate, often life-saving, intervension.

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