The Surgical Treatment of Morbid Obesity: Economic, Psychosocial, Ethical, Preventive, Medical Aspects of Health Care

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Surgical treatment of morbid, familial, juvenile-onset obesity in a 37-year-old, 260-pound, mother of three children by jejunoileal bypass was subsequently converted to gastric bypass. The resulting weight loss of 110 pounds resulted in personality changes and changes in family dynamics and was followed by divorce. Medical, psychosocial, and economic aspects of the case are discussed.

DR. H. THOMAS WIEGERT (Chairman, Department of Family Practice): Current estimates are that 40–50 percent of the population is overweight, and that 7 percent of the population is considerably overweight [1]. Obesity often co-exists with other problems such as hypertension and diabetes and, indeed, may not be the "reason" the patient came to see the physician [2]. In the case of the uncompromised, mildly obese person, the physician may hesitate to suggest "treatment," especially since there is a debate about whether being fat in and of itself is an impediment to health. Certainly, Americans seem obsessed about their weight, and the emphasis on leanness is associated with such psychophysiological disorders as anorexia nervosa and bulimia.

When weight is in excess of 40 percent of the ideal, it poses a qualitatively different problem from that of simple obesity and is called morbid obesity. Today we shall discuss a woman suffering from this disorder who, having been excessively obese for most of her life, underwent a jejunoileal bypass at age 32 years and, later, was converted to a gastric bypass when the side effects of the jejunoileal bypass became too difficult for her to manage. In order of presentation, Dr. James Anderson, Professor of Medicine, will discuss the medical complications of morbid...
obesity; Dr. Sylvia Wrobel, Department of Behavioral Science, will describe the patient's medical and social histories; Dr. Ward Griffen, Professor of Surgery, will discuss recent surgical approaches to the treatment of morbid obesity; and Mr. Ber- ton Whitaker, Director of Administrative Services, will provide an economic analysis of the patient's treatment at this medical center.

Dr. Anderson is Professor of Medicine and Professor of Clinical Nutrition at the University of Kentucky College of Medicine. Among his current interests and research is the use of high fiber diets both in patients with diabetes mellitus and vascular disease, and for selective reduction in lipid fractions. Dr. Anderson, will you start our discussion?

DR. JAMES W. ANDERSON (Professor, Department of Medicine): Very fat people are at risk for a number of diseases, including diabetes, hypertension, gall bladder disease, cancer of the breast (in women), osteoarthritis, and hypercholesterolemia. In the Framingham prospective study, persons 20 percent or more overweight developed high blood pressure ten times more frequently than persons of normal weight [3]. Bray, in his comprehensive study of 261 obese people, found that 25 percent had hypertriglyceridemia, and 11 percent hypercholesterolemia [4]. The Evans County study showed that men who are overweight at the age of 20, and who gained 30 pounds or more thereafter, had three times more cerebrovascular disease than underweight men who remained thin [5]. Obese persons tend to be insulin-resistant: Genuth calculated the 24-hour insulin production to be 31 U for normal persons; 114 U for non-diabetic, obese subjects; 4 U for those with juvenile diabetes; 14 U for thin adult diabetic patients; and 46 U for obese adult diabetic patients [6]. Although very obese people may escape the ravages of major disease, they are usually not healthy in a physiologic sense: many complain of joint pain, somnolence, dyspnea on exertion, and edema [7].

Massive obesity, with or without accompanying disease, is not conducive to a long life. According to actuarial studies, an obese person under the age of 50 is twice as likely to die as a person of normal weight; the risk is slightly less for the older obese person [8]. A 50-year-old man who is considerably overweight will have his life expectancy reduced by seven years. The obese diabetic has an increased risk of dying which is three to four times greater than that of the lean non-diabetic [8]. A more recent study, involving patients seen at a VA medical center, shows that actuarial studies may have underestimated the degree of mortality among the morbidly obese. Male patients in the age range 25 to 34 had a twelvefold excess mortality and those in the age range 35 to 44 approximately sixfold. After age 45 the risk declined until it was twofold for those aged 65 to 74 [9].

The most painful aspect of extreme overweight resides not in the pathophysiology, or in the fear of early death, but in social embarrassment and ostracism. Obesity is highly stigmatizing in a society that values slimness and associates overweight with lack of self-control, gluttony, and other characterological disorders.

Massive obesity may call for extreme measures. Diets, exercise programs, pills, and psychotherapy are usually not effective when people have reached an advanced stage of obesity. Surgical intervention—jejunoileal bypass surgery and gastric bypass—then becomes an option.

DR. WIEGERT: Thank you, Dr. Anderson. Our next speaker is Dr. Sylvia Wrobel. One of her research interests centers on patients who undergo operative procedures to control morbid obesity. Today she will share some of her knowledge about behavioral consequences for patients who undergo major life changes relative to medi-
cal and surgical treatment. Dr. Wrobel, will you now present the combined medical and social history of the patient?

DR. SYLVIA WROBEL (Department of Behavioral Science): The patient, a woman five feet five inches in height, weighed 260 pounds when first evaluated for jejunoileal bypass surgery; today, after three operations, she weighs 150 pounds. Currently divorced with three children, she is, at age 37, in apparent good health except for moderate anemia.

The patient spent her early years in a small Southern town. She recalls being very thin until age 10. There was a family tendency toward obesity: her mother was five feet tall and weighed over 200 pounds; her oldest sister weighed 377 pounds, and her brothers and another sister were all grossly overweight by adolescence. Three of the six children in this family have already had at least one operation for the correction of morbid obesity; a fourth is scheduled for such surgery in another state.

At age 16, when the patient had reached her full adult height of five feet five inches, she weighed 175 pounds. By then, she had dropped out of high school and married. When her first son arrived five years later, she weighed 200 pounds. During her three pregnancies her weight remained constant (probably because she was on diet pills) but rose sharply after each birth.

Concerned about her weight, the patient made multiple attempts to reduce with the help of Weight Watchers, spas, over-the-counter and prescription diet pills, and even a staple in her ear rechargeable each week for a fee of $15. These worked but only for short periods: the weight returned and, in fact, sometimes increased after each attempt.

When the patient was in her early thirties, her favorite sister had a jejunoileal bypass. This prompted her to give consideration to having the operation herself. Weighing 262 pounds she often felt unwell, tired, breathless, and incapacitated by headaches. She found it difficult to carry on her work in the small store owned by her husband. She was also embarrassed by her size and felt that her husband was ashamed of her, although he denied it.

Her husband was strongly opposed to her undergoing the surgery. Abandoning her usual nonaggressive manner, she insisted on having the operation. Her husband "was pretty good about it" once the decision had been made.

In August 1976 she was admitted to a community hospital for an end-to-end jejunoileal bypass and bilateral ligation. The post-operative course was uneventful, and she was discharged on her sixth post-operative day. Two days later, however, she was readmitted complaining of bright red blood from the rectum and was found to have a plasma hemoglobin of 9 grams/dl. She required four blood transfusions.

The patient was admitted again to the hospital in October 1976 to correct an electrolyte imbalance caused by excessive diarrhea, nausea, and vomiting. Both her serum potassium and serum calcium were low. After intravenous replacement, she was placed on oral supplementation. Her next hospital admission was in September 1977 for a hemorrhoidectomy, to relieve a condition which had flared because of the frequency of her bowel movements—typically 15 to 20 a day.

The patient now weighed 160 pounds, having lost approximately 100 pounds since her jejunoileal bypass. As she continued to lose weight, marital difficulties arose between her and her husband. He became jealous of other men talking with her. Whereas he had considered her to have a good personality at 260 pounds, at 140 he thought she was "nothing but a flirt." She, on the other hand, found old and hidden resentments boiling to the top. When she was obese he had never taken her out to
dinner or to business conventions. Now she rebuffed his invitations, reasoning that as he had been ashamed of her when she was fat, she would not accompany him now that she was thin.

After almost 20 years of fidelity her husband began an affair with her best friend: she found them kissing passionately in the room next to her office. Besides being terribly hurt, she could not understand how he could be so affectionate with another woman and not with her, now that she was thin. She reacted by having an affair with a man who gave her assurance, and verbal and physical affection.

In the meantime the patient continued to have a problem with extreme diarrhea (20 episodes a day) and rectal excoriation. Following a severe episode of rectal bleeding and unconsciousness, she was referred to the University of Kentucky Medical Center by her sister, on whom a conversion from a jejunoileal bypass had recently been performed. In April 1978 the patient underwent the conversion. Her postoperative course was uneventful and she was followed in the clinic for the next year. Her weight at the time of surgery was 152 pounds; it declined to a low of 147 pounds and then rose to a high of 185 pounds in March 1979. An X-ray of her stomach taken at that time showed that the gastric pouch was of an appropriate size (approximately 50 ml in volume), but that the anastomosis between the pouch and the jejunum had dilated so that the portion of the jejunum connected to the gastric pouch was acting as a reservoir.

The patient, at the time she was regaining weight, reported eating many small meals because of anxiety related to her pending divorce and to the terminal illness and alcoholism of her boyfriend. Stressful events became a common theme in her existence, fueling her desire to overeat. She lost her job when the divorce went through because of objections raised by her husband's girlfriend to her continuing to work in his business. She was subsequently unable to find steady employment—only short, poorly paid, fill-in jobs in factories or grocery stores. She was concerned about her sons: two of them, having moved in with their father, were now gaining weight, and the third had quit school and was experimenting with drugs.

The patient underwent a revision of the anastomosis at the University of Kentucky Medical Center in April 1979. At the time of admission, she was noted to be anemic with a hematocrit of 27 and with red cell indices indicating an iron deficiency anemia. Several examinations of the stool for blood came out negative. Following surgery the patient's weight declined to her present level of approximately 150 pounds. She continued to be anemic, and complained of dizziness. Her most recent hemoglobin, taken on July 31, 1979, was 10.2 gm. The anemia responded to administration of parenteral iron and occasional vitamin B12 shots.

After being unemployed for several months, the patient found two jobs which she is now holding simultaneously. One, in a factory, involves extremely arduous work, often 12 hours daily; the second, on weekends, is as a checkout clerk in a grocery store. She obtained these jobs by taking the General Educational Development Examination and pursuing every opening she heard about through employment agencies, advertisements, and friends.

Her old boyfriend still leaves fresh flowers on the seat of her car. Her new boyfriend has failed to persuade her to marry him and move with her children into his new house. She was tempted to do this because of her perilous financial situation, but is ambivalent—in part, because of the proximity of her husband, who lives down the street and, in part, because she fears entering a close relationship at this stage as she had married young, was always fat, and right now was "having a ball."
Our patient, like two of her sisters, has experienced difficulties with the many changes in her life resulting from bypass surgery and drastic weight loss. Nonetheless, five years after the first operation, she has higher self-esteem and a more positive outlook on life than ever before. She is healthier, feels better, and is better able to work. But, most important, she perceives herself as an attractive and competent person, in charge of her own life and the well-being of her children. She leaves no doubt in one’s mind that she would do it all again, if circumstances warranted it.

This patient appears representative of the morbidly obese patient, who commonly is overweight as a child and exhibits a sawtooth pattern of weight change, characterized by a loss and then a regaining of moderate-to-large amounts of weight. The patient is also typical of the morbidly obese patients seen at the University of Kentucky in that (1) she is female, (2) she married young while obese, and (3) she gained considerable weight after each pregnancy.

The literature on psychosocial effects of weight loss following surgery for obesity is based almost exclusively on the earlier operation, the jejunoileal bypass. This operation differs from the gastric bypass in that it tends to produce socially difficult reactions—particularly, frequent diarrhea and flatulence—and that it allows the patient to continue eating as much as before.

Most follow-up studies of the jejunoileal bypass report that patients experience a period of depression following surgery (perhaps because of the trauma of hospitalization) and then suffer anxiety as the weight begins to drop off and they are faced with the new role of a normal-sized person—in the framework of old relationships begun on the basis of being obese. Within two years, however, patients in most studies [10–12] show improved self-esteem, improved mood, and increased vocational effectiveness.

These studies bring to light stresses on the individual and on interpersonal relationships (divorce being a common measure) resulting from the surgical interventions and their effects. But they also demonstrate that surgery for obesity often breaks cycles of entrapment, stigmatization, and dieting failure, thus allowing a patient some control over his or her own life.

Many studies look at obesity as a symptom of some underlying problem [13]. They predict, therefore, dysfunctional responses to weight loss such as invalidism, alcoholism, or promiscuity. Personal or interpersonal difficulties following weight loss may be caused by unrealistic expectations not unlike those with which plastic surgeons are concerned—the patient may have blamed all problems and disappointments on extreme overweight and expect weight loss to make everything Hollywood-perfect. Characteristic also is the disruption of interpersonal relationships or family dynamics originally formed on the basis of one person being highly unattractive or nonassertive, or in which obesity serves to keep one person dependent.

**DR. WIEGERT:** Thank you, Dr. Wrobel, for your insightful analysis. Dr. Ward Griffen is Chairman and Professor of Surgery at the University of Kentucky College of Medicine. In addition to his many accomplishments in physiology and surgery, he is one of the pioneers in the development and refinement of surgical techniques to alter nutrition by rechanneling food in the gastrointestinal tract. His concern for patients extends far beyond technical aspects of surgery; this has been a factor in the success of his procedure in treating this difficult problem. Dr. Griffen, would you review for us the development of gastric bypass surgery and discuss the procedure in this patient?
Over the years various operative procedures have been used with varying degrees of success to cope with morbid obesity. Wiring the teeth has been well publicized in the lay press and in scientific journals; unfortunately, when the wires come off the weight goes up.

Vagotomy, used by Swedish surgeons, was first begun in psychology departments on the so-called “fat rat”—a type of rat that is congenitally fat. Vagotomy works well in rats, but people almost invariably develop ulcers, and their average weight loss is relatively insignificant—about 50 pounds—not a great deal in a person weighing 450 pounds.

Jejunocolostomy was the first operation to achieve substantial weight loss: within three months of surgery the patient literally melted away. The procedure proved to be risky, however. Of the ten patients who formed the original series, one died, and the rest had to have the procedure reversed because of metabolic consequences [14].

During the past two decades, two surgical approaches to the problem of morbid obesity have been devised, revised, and evaluated. One of the surgical approaches, the jejunoileal bypass, involves bypassing the majority of the small intestine leading to a situation of controlled malabsorption. The other approach, gastric bypass or gastroplasty, is to reduce the size of the gastric reservoir drastically. In this situation the goal is simply to limit the number of daily calories consumed.

The jejunoileal bypass operations are basically of two types: (1) an end-to-side anastomosis of the jejunum to the ileum close to the ileocecal valve and allowing for a bypass of approximately 90 percent of the small bowel, or (2) an end-to-end anastomosis between the jejunum and ileum with drainage of the bypassed segment of small bowel into the colon. The latter operation was devised after a significant number of the patients with the end-to-side anastomosis failed to achieve a satisfactory permanent weight reduction.

The gastric bypass operation was originally done with a loop of jejunum draining the upper gastric pouch and then as a Roux-en-Y jejunal limb drainage [15]. However, because of technical difficulties, a number of modifications, termed gastroplasty, have been suggested wherein the upper gastric pouch is allowed to drain into the distal stomach through a small opening in the staple line between the two segments of stomach. It is now recognized that the upper gastric pouch should be more than 45 ml in volume, and the problem area of any of the procedures continues to be the stoma draining the upper gastric pouch. Whether the food goes into the distal stomach or the small bowel, if the stoma dilates, the patient ceases to lose weight.

The technical aspects of the gastric bypass operation are more demanding than for the jejunoileal bypass procedures. Therefore a learning curve exists both for performing the gastric bypass correctly as well as in eliminating early post-operative complications. The early complications seen after jejunoileal bypass are few and are generally those associated with operations on any obese individual; namely, wound problems including dehiscence, deep venous thrombosis and thromboembolic disease, and, rarely, intra-abdominal infection. The incidence of anastomotic leak is higher in the gastric bypass operation than the small bowel bypass procedure. In addition, the current mortality rate following gastric bypass operation still is around 1 percent as compared to less than 0.5 percent with jejunoileal bypass.

However, the long-term evaluation of the two procedures clearly has identified the superiority of the gastric procedures over the jejunoileal bypass as an appropriate operation for morbid obesity. There have been four studies comparing jejunoileal bypass with the gastric procedure. Two of the studies were not randomized and two
were. In the two nonrandomized studies, the one by Alden [16] compared 100 patients who underwent an end-to-side jejunooileal bypass procedure to the next 100 patients who underwent a gastric bypass operation without transection of the stomach but with a jejunal loop draining the upper gastric pouch. After a year, the weight loss in each group was approximately equal with a median percentage weight loss of 31 percent following jejunooileal bypass and 36 percent following the gastric bypass. Severe diarrhea, electrolyte disturbances requiring medication, renal calculi (10 percent), arthritis, and liver disease were seen in the jejunooileal bypass group and not found after gastric bypass.

Prolonged vomiting was seen in several patients after gastric bypass but disappeared with time; mild dumping was described in three patients; and one patient each had bleeding from a marginal ulcer, which responded to non-operative therapy, and symptoms of reflux esophagitis also treated non-operatively. In the other nonrandomized series by Deitel et al. [17], 64 patients underwent jejunooileal bypass, nine with an end-to-end anastomosis and the other 55 with an end-to-side anastomosis. All 64 patients were compared with a subsequent 110 patients who underwent a gastroplasty with the formation of the stoma at the greater curvature end of the staple line. The list of complications following jejunooileal bypass include persistent electrolyte abnormality in 25 percent of the patients, polyarthritis, renal calculi, excess flatus and bloating, and incisional hernia in six. The late complications following gastric partitioning consisted of eight patients with a ventral hernia. However, in the long-term follow-up the patients with jejunooileal bypass showed a 33 percent average weight loss compared to only 16 percent in the patients undergoing gastric partitioning. It is now well recognized that the form of gastric partitioning used by these authors is not a satisfactory gastric operation for morbid obesity.

The two randomized studies comparing jejunooileal to gastric bypass appeared in 1977. In the one by Buckwalter [18], the randomization scheme was abandoned because of the disastrous consequences of jejunooileal bypass with regard to diarrhea and electrolyte problems with a high rehospitalization rate. Nevertheless, the conclusion drawn from comparing these two groups of patients was that the gastric bypass was superior to the jejunooileal bypass in that it produced the same weight loss but with fewer long-term sequelae.

The second randomized, prospective study was reported by Griffen et al. [19,20]. Two groups of 50 patients each were subjected to the jejunooileal or the gastric bypass at this institution over a four-year period (1974–1978). The groups are similar in terms of age-sex composition, height, and preoperative weight (Table 1); they do not differ significantly in terms of pathological conditions present prior to surgery (Table 2) or average weight loss experienced after surgery (Table 3). While the jejunooileal bypass may have fewer early complications because it is technically easier to perform, the long-term sequelae lead to many more readmissions to the hospital and reanastomoses or conversions to another form of weight reduction operation in the

| TABLE 1 | Patient Populations |
|---------|---------------------|
|         | Gastric (50) | Jejunooileal (JI) (50) |
| Age     | 32.6         | 32.8         |
| Sex     | 35 f, 15 m  | 33 f, 17 m  |
| Pre-Op. Wt (kg) | 153.7     | 155.9     |
| Height (cm) | 163         | 166.8         |
TABLE 2
Concomitant Conditions

|                     | Gastric (50) | Jejunoileal (JI) (50) |
|---------------------|--------------|-----------------------|
| Total               | 37           | 36                    |
| Hypertension        | 10           | 12                    |
| Respiratory         | 7            | 7                     |
| Cardiac             | 5            | 3                     |
| Diabetes            | 16           | 18                    |
| Hyperlipidemia      | 5            | 4                     |
| Cholelithiasis      | 15           | 9                     |

TABLE 3
Post-Op Weight Loss Statistics (Kg)

|                  | Gastric (50) | JI (50) |
|------------------|--------------|---------|
| 3 months         | 20.7         | 21.3    |
| 6 months         | 35.3         | 35.6    |
| 1 year*          | 53.2         | 56.0    |

*Includes 42 gastric and 38 jejunoileal patients

TABLE 4
Overall Complications

|                  | Gastric (50) | JI (50) |
|------------------|--------------|---------|
| Operative deaths | 0            | 0       |
| Late deaths      | 2            | 2       |
| Rehospitalization| 7            | 29      |
| Reanastomosis    | 1            | 28*     |
|                  | 10           | 59      |

*Includes conversion from JI to gastric, as of 1982

jejunoileal group (Table 4). These findings led Griffen to the same conclusion as Buckwalter regarding the superiority of the gastric procedure.

During the last decade, many articles have appeared documenting significant long-term sequelae following jejunoileal bypass. These have included persistent diarrhea with or without electrolyte imbalance, liver failure, renal calculi, bone problems including polyarthralgia and osteomalacia, vitamin deficiency, increased tendency to cholelithiasis, and inadequate absorption of prescribed medications. These complications are seen rarely or not at all following gastric bypass procedures. Two recent reviews concerning operative procedures for morbid obesity have documented the relative lack of long-term sequelae following gastric operations as compared to jejunoileal bypass [21,22] (Table 5). It is for this reason that many bariatric surgeons are now recommending abandonment of the jejunoileal bypass as an appropriate procedure for morbid obesity and also recommending conversion of the jejunoileal bypass to a gastric procedure whenever the patient develops sufficiently severe sequelae to warrant surgical reintervention [23].

QUESTION FROM THE AUDIENCE: Is there a problem with excessive weight loss?

DR. GRIFFEN: These patients invariably level off at a weight which is anywhere from
10 to 30 pounds above their ideal weight. The patient under discussion today is about 30 pounds above her ideal weight. Persons treated for morbid obesity are foodaholics: they will eat whether they are hungry or not. After the operation they will get to the point where the number of calories they are able to consume, even with a small gastric pouch, is equivalent to what they are burning up. I have yet to see patients drop far below their ideal weight. They all ask me about this. I tell them to relax.

QUESTION: What is the risk of the surgical procedure?

DR. GRIFFEN: We have done close to 600 of these operations and have lost four patients. The overall morbidity of the operation is about 5 percent.

DR. WIEGERT: Thank you, Dr. Griffen. Berton Whitaker, with a degree in hospital administration, is the Director of Administrative Services at the University Hospital of the University of Kentucky. His professional interests include methodologies for calculating direct, indirect, and marginal costs and benefits of technology in health care. Mr. Whitaker, will you now review the financial aspects of this patient's surgery for her morbid obesity?

BERTON WHITAKER (Director of Administrative Services): Gastric bypass, with a price tag of well over $4,000, is an expensive operation. The federal and state governments are now taking a hard look at such high-cost technologies to see if they are justified in terms of net benefits. Beneficial outcomes would include a reduction in the cost of medical care needed by the patient over a lifetime, or an improvement in the patient's ability to be self-supporting. Governmental scrutiny was highly predictable in light of the rapidly rising cost of care and the ever-increasing portion of the cost covered through government insurance programs. How well gastric surgery, or any surgery intended to reduce obesity, will fare in the competition for scarce health dollars will depend on whether society can be convinced that (1) it is not just a cosmetic procedure, and (2) the condition it is supposed to alleviate is truly disabling.

The question of government reimbursement is an issue in the case under discussion. The total cost of the gastric bypass procedure for this patient, including the surgeon's fees and outpatient care, was $4,674. Blue Cross-Blue Shield provided $3,249, and the patient, $549. The patient was billed about $3,800 for the revision of the gastric bypass. (This figure does not include the cost of outpatient care which the
hospital canceled because of the patient's inability to pay.) By the spring of 1979, when the revision took place, the patient had lost her job and, with it, her private medical insurance. She then qualified for Medicaid, but the latter refused to pay for the operation: initially, because it said that the procedure was purely cosmetic, and later, because of the date the Medicaid card was issued. Eventually, Medicaid contributed $468. Currently under dispute between the patient and Medicaid is $1,500 of the medical bill.

Not reflected in the medical bill were the indirect costs of treatment to the patient: loss of income derived from four to six weeks of work absences resulting from the side effects of surgery, travel expenses for trips back and forth to the Medical Center from her home in rural Kentucky, and a new wardrobe.

What benefits justify these costs? Due to an improved self-image the patient was able to pursue employment opportunities aggressively. Her health was good enough to allow her to manage an arduous factory job on weekdays and a job as a checkout clerk on the weekends. Had she remained obese, it is likely that she would have gone on public assistance. Furthermore, without significant weight reduction the patient would have been at risk for diseases that are costly to treat. Given that obese persons are disproportionately represented among high-cost users of medical services [24], it seems likely that her medical expenses would have eventually exceeded the cost of all of the surgical procedures used to treat her morbid obesity.

DR. WIEGERT: Thank you, participants. Certain conclusions can be drawn from this case discussion of morbid obesity: First, morbid obesity is a serious, perhaps life-threatening disorder. Second, surgical treatment, while expensive, is cost-effective, especially when compared with the much less successful medical forms of treatment. The gastric bypass procedure not only produces good weight loss, but allows the patient to function productively without many of the well-known side effects associated with other types of surgical intervention. What cannot be subjected to a cost-benefit analysis are the psychosocial benefits to the patient: improved morale, a better self-image, a sense of self-worth, and self-respect. The patient's quality of life has been improved in those ways that probably have the most meaning to her.

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