Obesity has become an epidemic problem in the United States and is rapidly spreading to most Western countries. This has important implications for the health of the individual patient as well as the overall health of a population. For example, a recent study confirmed that patients with obesity, defined as a body mass index (BMI) (weight in kilograms divided by square of height in meters) of 30 kg/m² or higher, have an increased risk of mortality.1

Obesity now affects approximately 22% of adults in the United States.1 Severe or morbid obesity, defined as a BMI of 35 kg/m² or higher, afflicts approximately 4.5 million women and 3.5 million men in the United States.2 The evidence is overwhelming that there is a genetic predisposition to this problem, aggravated by the easy availability of inexpensive, good-tasting, high-fat, high-energy foods.3-5

Annual direct health care costs for obesity-related medical conditions in the United States have been estimated at nearly $40 billion, with another $30 billion related to efforts at weight reduction.6 Obesity is responsible for the enormous increase in type 2 diabetes mellitus1 and its complications of retinopathy, neuropathy, stroke, and renal disease. The prevalence of these vascular and neurologic diseases is further influenced by the marked increase in hypertension associated with obesity. Other comorbidities include degenerative joint disease (involving the hips, knees, ankles, feet, and lower back); gastroesophageal reflux; sleep apnea; obesity hypoventilation syndrome; female sexual hormone dysfunction, including the syndrome of polycystic ovaries associated with amenorrhea, dysmenorrhea, infertility, and hirsutism (Stein-Leventhal syndrome); an increased risk of malignancy, including uterine, breast, prostate, gallbladder, and colon cancers; urinary incontinence; and pseudotumor cerebri. Patient well-being is affected not only by these medical problems but also by poor self-image and possible employment discrimination.

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The above-mentioned obesity comorbidities are thought to be consequences of both the "metabolic syndrome" secondary to increased visceral fat metabolism and an increased intra-abdominal pressure in centrally obese patients (those with android obesity). This type of obesity is seen in both men and women who are severely obese.

Despite a multibillion-dollar antiobesity industry, diets with or without behavioral modification and with or without drug therapy are simply not working for morbidly obese patients. Although many will lose weight through one of the diet programs, the benefit is almost always short-lived, and the cumulative recidivism rate is almost 100% at 5 years.10 Based on these and related data, a National Institutes of Health (NIH) Technology Assessment Conference Panel concluded that dietary weight reduction programs have had a dismal success rate for the treatment of severe obesity.11 The failure of diet programs for the morbidly obese has also not been resolved with the addition of recently approved weight reduction medications. These drugs, orlistat (which increases fat loss in the stool from inhibition of gastrointestinal lipase) and sibutramine (which inhibits appetite), achieve losses of only 6% to 10% of weight in responding patients.12,13

Given the failures of diets and the limited efficacy of drug treatments, physicians have searched for alternatives to help morbidly obese patients lose weight and avoid obesity-related comorbidities. One option is surgery. As Balsiger et al14 report in this issue of Mayo Clinic Proceedings, the surgical treatment of severe obesity is effective and long-lasting. Their results are consistent with other series that have shown that the average patient loses two thirds of her or his excess body weight (or approximately one third of total weight) within 1 year of a gastric bypass operation and maintains loss of 60% of excess body weight at 5 years and 50% of excess body weight at 10 years after surgery.15-17 It is rewarding to the patient and the treating medical team to perform 1 operation and have 3, 4, or more...
medical problems resolve or improve. Despite the efficacy of surgical treatment, not all insurance companies recognize the wisdom of this aggressive approach to produce weight reduction. Many are only interested in this year's bottom line and not the potential benefit to the patient 5 to 10 years after gastric bypass surgery.

Perhaps one of the limitations to the widespread acceptance of bariatric surgery is that no prospective randomized trials have compared surgical with nonsurgical treatment. Further, there probably never will be such a trial. The closest approximation will likely be the Swedish Obesity Subjects (SOS) study in which 5000 severely obese Swedish citizens are being entered into a database. Among these, some type of obesity surgery procedure is planned for 1000 patients. These surgery patients will then be compared with age-, weight-, and comorbidity-matched control patients who will not have undergone surgery. Unfortunately, the surgical procedures being performed on the vast majority of these patients in Sweden are gastric banding and vertical banded gastroplasty, which result in markedly less weight loss than does the gastric bypass procedure. Nevertheless, the early data in the SOS study show a decreased length of sick leave, decreased obesity-related comorbidities, and an improved quality of life in the surgically treated patients.

A 1991 NIH Consensus Development Conference Panel concluded that patients should be considered eligible for obesity surgery if they have a BMI of 35 kg/m² or higher with obesity-related comorbidity or 40 kg/m² or higher without comorbidity and have failed dietary weight loss. The panel's recommendation (enthusiastically endorsed by the insurance industry) that a patient must have documented failure of dietary weight loss programs before surgery is considered simply delays the inevitable. Diets have been shown never to work for these individuals over the long term. Some insurance companies have declared any "treatment of obesity" as an exclusion criterion on policies offered to employees. These same companies claim that it is because employers do not wish to cover surgical treatment of obesity. But this is bad medicine being condoned by the insurance companies. To overcome this, legislation has been passed in Georgia and Virginia to make surgery for obesity according to the NIH criteria a health benefit that must be offered to employers. Some companies have declared any "treatment of obesity" as an exclusion criterion on policies offered to employees. These same companies claim that it is because employers do not wish to cover surgical treatment of obesity. But this is bad medicine being condoned by the insurance companies. To overcome this, legislation has been passed in Georgia and Virginia to make surgery for obesity according to the NIH criteria a health benefit that must be offered to employers. Furthermore, I believe it would be reasonable to offer bariatric surgery to patients with a BMI of 30 kg/m² or higher and obesity-related comorbidity such as type 2 diabetes, severe hypertension, or pseudotumor cerebri, as it is at this level of obesity that an increased mortality risk is observed. Obesity surgery is currently available in Europe for obese patients with the lower BMI criterion.

Another issue frequently raised in discussions of bariatric surgery is whether the surgery is safe. As Balsiger et al noted, Roux-en-Y gastric bypass surgery was associated with 1 hospital death in their series of 191 patients. Death in this patient was not a direct complication of surgery. Instead, the patient died of a presumed cardiac arrhythmia on the fourth postoperative day. Postoperative in-hospital morbidity was largely the result of wound infection and cardiopulmonary dysfunction. The rates of mortality and morbidity reported by Balsiger et al are not surprising when one considers the potential for perioperative anesthetic and surgical complications in morbidly obese patients.

I am concerned, however, that the report by Balsiger et al does not adequately describe long-term postoperative morbidity in this patient population. This concern may arise from the Mayo Clinic pattern of practice in which patients may travel long distances to receive surgery and later return home for their extended follow-up. My specific concern about long-term morbidity relates to the potential micronutrient deficiencies that can occur after the gastric bypass operation. These include iron deficiency anemia in menstruating women, vitamin B₁₂, calcium, and magnesium deficiencies, and, on rare occasions in patients who have excessive vomiting, thiamine deficiency that can lead to a Wernicke-Korsikoff encephalopathy or profound peripheral neuropathy. Patients who are vomiting frequently need urgent endoscopic dilatation. If patients are unable to be followed up in person at the Mayo Clinic, then the bariatric surgical team must make certain that these micronutrients are measured annually by the patients' primary care physicians so that deficiencies are recognized and corrected. This is especially true for the malabsorptive procedures (distal gastric bypass or partial bilipancreatic bypass) that have been performed and previously described by a Mayo Clinic bariatric surgery team. The malabsorptive procedures may be associated with protein-energy malnutrition, steatorrhea, fat-soluble vitamin deficiencies, and osteoporosis.

The weight loss statistics in the study by Balsiger et al are impressive. But the data are derived from self-reported weights, and these may be in error. As in most series, patients appear to regain some weight in the second postoperative year. In most patients this is not a major problem. But some patients "nibble" through the procedure with high-fat junk foods, such as potato chips, or lose their dumping syndrome symptoms with high-density carbohydrates. These patients need dietary counseling. This may be a problem if the patients are not coming back to the Mayo Clinic for annual follow-up visits. This surgery, more than any other, requires intensive, long-term postoperative care. At the Medical College of Virginia Hospitals (MCVH), patients are told that the operation is designed to help them help themselves; surgery alone will not do it all (lose the weight and keep it off) for them; it requires patient commitment to following the dietary guidelines and involvement
with an active exercise program. Follow-up of these patients with a questionnaire is not adequate.

We agree with the authors that the most effective operation for this disease is a gastric bypass as documented in randomized studies by our group and others as well as in retrospective studies. A useful review of the different operative procedures and the overall efficacy of obesity surgery was published in 1998. We are concerned with the malabsorptive procedures, including the partial biliopancreatic bypass and the duodenal switch operations, which may be associated with steatorrhea, fat-soluble vitamin deficiencies, and osteoporosis from calcium and vitamin D deficiency. We are also concerned with the laparoscopic adjustable silicone gastric banding procedure being performed in Europe in huge numbers and currently under Food and Drug Administration evaluation in the United States. In 35% of the patients in our series we have removed these bands and created a gastric bypass. Furthermore, the gastric bypass procedure is now being performed laparoscopically.

The length of hospital stay following the gastric bypass operation is determined by a variety of factors, including patient characteristics and practice routines. In my opinion, the length of stay reported by Balsiger et al seems long, although it has decreased more recently to about 5 days. At MCVH, the average length of stay is currently 3.6 days, and a number of patients are discharged on the second postoperative day. If the concern for early discharge is that some patients live far from Mayo Clinic, they should be encouraged to stay in a nearby hotel until they are deemed ready to return to their homes. Patients who have bypass surgery at MCVH stay in the Richmond area for a week to 10 days after the procedure, at which time they are seen in the clinic, have their skin staples removed, and meet with a dietician.

In conclusion, this is a wonderful operation to treat an exasperating problem. Patients feel better physically and psychologically. They hug their surgeons when they come back for follow-up without the need for a cane or walker, without diabetes or heartburn, no longer taking antihypertensive medications (or taking markedly reduced dosages), without the need to wear a perineal pad for urinary incontinence, without constant headaches from pseudo-tumor cerebri, able to sleep at night without a continuous positive airway pressure machine, without the need to carry a supplemental oxygen tank, with less or no pain in their hips, knees, or lower back, pregnant if they have been infertile. Unfortunately, there is a high risk of developing an incisional hernia that requires operative repair. Newer laparoscopic gastric bypass procedures being developed and embraced with enthusiasm by many bariatric surgeons will prevent occurrence of incisional hernias in the future.

I commend Dr Balsiger and his colleagues on their work with a challenging but rewarding patient population. I only hope that the insurance industry becomes less interested in cost-containment and more motivated to provide the care obese patients deserve. Insurance companies will probably find that expanding current coverage to include bariatric surgery will be less expensive for them in the long run. We all hope that someday better nonsurgical therapeutic approaches will become available for these individuals. The currently available pharmaceutical agents cannot approach the efficacy of surgical intervention. Gene therapy may provide the answer, but that certainly seems a long way off as we are just beginning to learn what genes may be involved in obesity. It is highly probable that there will be many involved genes and genetic intervention may be quite difficult.

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REFERENCES


