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Medical and surgical options in the treatment of severe obesity

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Abstract

Weight loss programs, diets, and drug therapy have not shown long-term effectiveness in treating morbid obesity. A 1992 statement from the National Institutes of Health Consensus Development Conference affirmed the superiority of surgical over nonsurgical approaches to this condition. Bariatric surgical procedures work in 1 of 2 ways: by restricting a patient's ability to eat (*restrictive* procedures) or by interfering with ingested nutrient absorption (*malabsorptive* procedures). Many of these procedures can be performed by a laparoscopic approach, which has been shown to reduce operative morbidity. In the United States, the primary operative choice for morbidly obese patients has recently shifted from vertical banded gastroplasty (VBG) to the Roux-en-Y gastric bypass (RYGBP). VBG, a purely restrictive procedure, has fallen into disfavor because of inadequate long-term weight loss. RYGBP combines restriction and malabsorption principles, and has been shown to induce greater weight loss than VBG. Other procedures currently being offered include laparoscopic adjustable gastric banding; biliopancreatic diversion (BPD), including the duodenal switch (BPD-DS) variation; and distal gastric bypass (DGBP). Laparoscopic adjustable gastric banding with the LAP-BAND system (INAMED Health, Santa Barbara, CA), a restrictive procedure involving placement of a silicone band around the upper stomach, was introduced in the early 1990s and approved by the US Food and Drug Administration for use in the United States in June 2001. Outside the United States, LAP-BAND surgery is the most commonly performed operation for severe obesity. The BPD, BPD-DS, and DGBP are all malabsorptive procedures offered primarily by laparotomy. They have been shown to induce good long-term weight loss but have a higher rate of adverse nutritional complications. Many safe and effective surgical options for severe obesity are available. More scientific appraisals comparing different procedures and open and laparoscopic approaches are needed.

The problem of obesity has reached epidemic proportions in the United States. More than 50% of adults are obese or overweight, and 5% are severely obese (body mass index [BMI] of ≥35) [1]. Numerous studies have demonstrated a strong relation between BMI and the development of life-impairing comorbidities, such as hypertension, diabetes (type 2), atherosclerosis, sleep apnea, and osteoarthritis. Obesity is associated with a higher risk of cancer (breast, colon, uterine) and premature death. Patients with severe or morbid obesity (BMI >35), the focus of this review, are consequently most severely affected by the disease, have a poor quality of life, and thus have the greatest need for weight loss therapy. Numerous medical and surgical treatments for severe obesity have come and gone over the years, underscoring the challenge and complexity of obesity management. The intent of this review is to summarize the current status of medical and surgical options for the treatment of severe obesity.

Management of obesity

Numerous strategies for weight loss have been proposed over the past few decades, making the task of evaluating obesity management daunting. In an effort to develop consensus and provide practical guidelines for obesity management, the National Institutes of Health (NIH) published an evidence-based recommendation for the treatment of obesity [1]. The report, published in 2000, was based on evidence from 394 randomized, controlled trials of obesity therapy, and was compiled by a panel of 24 internationally recognized obesity experts. It has been endorsed by major academic obesity organizations, including the NIH, the National Heart, Lung, and Blood Institute, and the North American Association for the Study of Obesity, and represents the most current and authoritative evidence-based guideline for obesity management in print. Table 1 is a summary of NIH-recommended obesity treatments based on severity of obesity according to BMI.

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Higher risk modalities, such as pharmacotherapy and surgery, are reserved for patients with higher BMI based on risk-benefit analysis. Similar evidence-based recommendations [2] are also available from the Shape Up America! Foundation and the American Obesity Association.

First-line therapy: lifestyle changes

First-line therapy for obesity carries the least risk and consists of diet, exercise, and behavior modification. Although hundreds of commercial and noncommercial diet programs have been proposed, they appear to achieve weight loss similarly by reducing calorie intake below energy expenditure. Low calorie diets (LCDs; 800 to 1,500 kcal/day) are recommended over very low calorie diets (VLCDs; <800 kcal/day) because LCDs are as effective as VLCDs at 1 year with less risk of nutritional deficiency [3]. LCDs have been shown to reduce body weight by an average of 8% and reduce abdominal fat content over a period of 6 months [1]. Physical activity (3 to 7 sessions a week, lasting 30 to 60 minutes each) can achieve modest weight loss (2% to 3% of body weight) independent of dietary therapy [1,4]. Behavior therapy is based on learning principles, such as reinforcement, and is meant to assist in overcoming barriers to compliance with dietary therapy or increased physical activity. Evidence-based analysis demonstrates that behavior therapy can provide additional benefit in weight loss, but the intervention must be sustained [1]. No one behavior-modification strategy appears superior.

Combination strategies using diet, exercise, and behavior therapy have been shown to be more effective in the short term than diet or exercise alone [1]. First-line treatments, however, are usually ineffective in people who are morbidly obese. Although weight reduction by as little as 5% of body weight has been shown to improve many obesity comorbidities, this modest weight reduction is insufficient to result in significant improvement. Additionally, weight regain is common in severely obese patients, even when approaches are used that combine dietary therapy with exercise and behavior modification. There are no published studies demonstrating significant sustained weight loss by diet therapy, exercise, or behavior modification in morbidly obese patients.

Second-line therapy: pharmacotherapy

Pharmacotherapy is second-line therapy recommended when lifestyle changes are ineffective in yielding significant weight loss. Increased risk is accepted for potentially enhanced weight loss. Amphetamines, as a class of weight loss drugs, have been in use since the 1940s [5–8]. The drugs, introduced as stimulants, were found also to be strong anorexiants. Over-the-counter medications, such as phenylpropanolamine, also appeared. Phenylpropanolamine exhibited milder anorexic effects and side effects, and found widespread use. In 1984, Weintraub et al published a well-controlled study [9] demonstrating the efficacy of combining phentermine and fenfluramine in patients with mild obesity. In a 4-year study, they combined these drugs with a program of diet, exercise, and behavior modification to effect significant weight loss with little morbidity [10,11]. The drug combination, popularly called Phen-Fen, gained widespread acceptance and use, often being prescribed without behavior-modification therapy. Observations of significant cardiac and pulmonary artery damage later led to the withdrawal of fenfluramine from the market. Phentermine alone has proved too ineffective to be widely used.

For a new drug to be considered efficacious in the treatment of obesity, it must meet 2 criteria in randomized clinical trials: (1) the mean weight loss in the drug-treated group after 1 year must be at least 5% more than the mean weight loss in the placebo-treated group, and (2) a greater percentage of patients in the drug-treated group at 1 year must lose at least 5% of their baseline weight compared with those in the placebo-treated group, according to US Food and Drug Administration (FDA) criteria [12]. These criteria were adopted because weight losses of this degree have been associated with significant health improvements. To date the FDA has approved 2 drugs that have met these criteria, sibutramine HCl monohydrate (Meridia; Abbott Laboratories, Chicago, IL) and orlistat (Xenical; Roche, Oak Park, IL) (Table 2). Sibutramine is a serotonin reuptake inhibitor and works as an appetite suppressant. Orlistat binds to ingested fats, preventing intestinal absorption. Despite their different mechanisms of action, the drugs have shown remarkably similar efficacy, producing a weight loss of 6% to 10% of initial body weight at 1 year, with high weight regain once the drug is stopped [13].

NIH guidelines recommend that drugs should be used only as part of a comprehensive program that includes behavior therapy, diet, and physical activity. Appropriate monitoring for side effects must be continued while drugs are part of the regimen. Because obesity is a chronic disease, the short-term use of drugs is not helpful. The health professional should include drugs only in the context of a long-term treatment strategy. The risk-benefit ratio cannot be predicted at this time because not enough long-term data (>1 year) have been published on either of the available drugs.

Surgical approaches to morbid obesity

Most surgeons, health professionals, and medical insurance providers today adhere to the guidelines for surgical management of obesity established at the 1991 NIH Consensus Conference on Gastrointestinal Surgery for Severe Obesity [14]. The panel of experts reviewed the long-term data on safety and efficacy of medical and surgical weight loss and concluded that surgical therapy should be offered to morbidly obese patients who are unresponsive to nonsurgical therapy for weight loss. The rationale for surgery was based on a large number of studies indicating that “dietary weight reduction with or without behavioral modification or drug therapy had an unacceptably high incidence of weight

Table 1
National Institutes of Health guideline for obesity management [1]

Treatment	BMI category				
	25–26.9	27–29.9	30–34.9	35–39.9	≥40
Diet, physical activity, and behavior therapy	With comorbidities	With comorbidities	+	+	+
Pharmacotherapy		With comorbidities	+	+	+
Surgery			With comorbidities	With comorbidities	With comorbidities

BMI = body mass index; + = use of indicated treatment regardless of comorbidities.

Table 2
US Food and Drug Administration–approved drugs for weight loss [1]

Drug	Dose	Action	Adverse effects
Sibutramine	5, 10, 15 mg; 10 mg qd orally to start, may be increased to 15 mg or decreased to 5 mg	Norepinephrine, dopamine, and serotonin reuptake inhibitor	Increase in heart rate and blood pressure
Orlistat	120 mg; 120 mg tid orally before meals	Inhibits pancreatic lipase, decreases fat absorption	Decrease in absorption of fat-soluble vitamins; soft stools and anal leakage

regain in the morbidly obese within 2 years after maximal weight loss."

A study by Martin and colleagues compared results in severely obese patients treated by surgery with those in patients on a VLCD alone [15]. The authors found better initial weight loss as well as sustained weight loss in the surgery group. In fact, there were no patients in the VLCD group who maintained significant weight loss at 7 years.

Despite the introduction of sibutramine and orlistat since the 1991 conference, results of all nonsurgical therapy for weight loss in the morbidly obese remain poor. According to the guidelines, patients are eligible for surgery if they have failed attempts at nonsurgical weight loss and have a BMI ≥35 with comorbidity or a BMI ≥40 with or without comorbidity. The only procedures endorsed by the panel were gastric bypass (GBP) and vertical banded gastroplasty (VBG), which at the time were the primary procedures performed in the United States, with both having well-documented long-term data. Since the 1991 conference, there has been a dramatic increase in acceptance of bariatric surgery, with a corresponding increased understanding of alternative procedures and new approaches, particularly laparoscopic bariatric procedures.

Strategies for surgically induced weight loss

Two primary strategies of surgically induced weight loss have arisen over the past 50 years: gastric restriction and intestinal malabsorption. Some procedures combine elements of restriction and malabsorption. The restrictive procedures cause early satiety by creation of a small gastric pouch and prolong satiety by creation of a small outlet to that pouch. Restrictive procedures include many varieties of gastroplasty (Fig. 1) and gastric banding (Fig. 2). In these procedures, the outlet is reinforced by prosthetic material to prevent dilatation. The pouch and the outlet must be small enough to adequately restrict intake, yet not so small as to cause obstruction. Adjustable gastric banding systems*—the LAP-BAND (INAMED Health, Santa Barbara, CA), the MIDBAND (Medical Innovation Development, Villeurbanne, France), the Swedish Adjustable Gastric Band (Obtech Medical, Baar, Switzerland), the Heliogast Band (Helioscopie, Vienne, France), and others—allow for fine adjustment of the outlet diameter, which may offset the disadvantages of a fixed, nonadjustable outlet.

Significant dietary compliance is required with restrictive operations, because the intake of high-calorie liquids or soft foods is not inhibited by the narrow outlet and will result in failure to lose weight. Benefits include technical simplicity with no staples, anastomoses, or bypasses of any part of the intestinal tract. Protein calorie malabsorption and vitamin and mineral deficiencies are unlikely events after restrictive procedures. Relative disadvantages include less weight loss than with alternative procedures and more late failures due to pouch or anastomosis dilatation or maladaptive eating behavior. Excessive narrowing by the reinforced outlets (less common with the adjustable band) may cause frequent vomiting and gastroesophageal reflux. This has responded to removal of fluid and enlargement of the outlet with the adjustable banding, but has required operative intervention with fixed-diameter restrictive devices. Additionally, the prosthetic material at the outlets may erode into the gastric lumen, which usually requires operative correction.

Malabsorptive procedures in use today include the biliopancreatic diversion (BPD), with or without duodenal switch (Fig. 3), and the distal gastric bypass (DGBP). These procedures involve some degree of gastric volume reduc-

* These devices often are referred to generically as *laparoscopic adjustable gastric bands*. The LAP-BAND device is the only such device approved by the FDA for use in the United States.

tion, but primarily depend on bypass of various lengths of small intestine to cause malabsorption akin to a "controlled short-gut syndrome." The degree of malabsorption is determined by the length of common channel where admixture of digestive enzymes occurs. Benefits include greater sustained weight loss that is less dependent on dietary compliance than are the restrictive procedures. Disadvantages include increased risk of malnutrition and vitamin deficiencies, with a need for close physician follow-up to reduce these risks. Intermittent diarrhea or steatorrhea is common and varies according to dietary fat intake. The malabsorptive procedures are generally more technically complex than the restrictive operations, with two anastomoses, including partial gastric resection.

Roux-en-Y gastric bypass (RYGBP; Fig. 4), an intermediate operation, has historically been considered a restrictive operation, although many argue that there is a degree of malabsorption due to the foregut bypass. Although there are many variations, most surgeons create a 15- to 50-mL gastric pouch (isolated or stapled in continuity) with a 75- to 150-cm Roux-limb connected as an enteroenterostomy to the jejunum 30 to 50 cm from the ligament of Trietz [16]. Because of the foregut bypass, associated vitamin and mineral deficiencies may occur with RYGBP, but protein calorie malnutrition rarely, if ever, occurs.

Laparoscopic approaches

Laparoscopic approaches to bariatric surgery, including VBG, adjustable gastric banding, and RYGBP, emerged at about the same time in the early to mid-1990s, in the wake of laparoscopic cholecystectomy. Advantages over open bariatric approaches included reduced perioperative morbidity (especially wound related) and shorter recovery [17–19]. Because of the complexity of these procedures in morbidly obese patients, the transition to common practice has been slower than some of the second-generation procedures, such as laparoscopic hernia repair and Nissen fundoplication. Hybrid procedures using hand-assisted laparoscopic techniques have developed with the intention of providing similar benefits seen with completely laparoscopic procedures [20]. A major element of laparoscopic bariatric surgery is the importance of adequate training in both advanced laparoscopic surgery and bariatric surgery.

North American preferences in bariatric surgery

A 1999 survey of the membership of the American Society for Bariatric Surgery identified bariatric surgical preferences in North America [21]. Two major trends in the past decade are readily apparent. First, the most frequently performed bariatric procedure is RYGBP, performed 70% of the time, compared with gastric restrictive procedures, which are performed in 16% of cases (gastric restrictive procedures include VBG, gastric banding, and Silastic [Dow Corning, Midland, MI] ring gastroplasty). Malabsorptive procedures, represented by BPD, are performed in 12% of cases. The ascendancy of RYGBP is likely driven by reports of unsatisfactory long-term weight loss and reoperation rates after VBG [22,23]. Thus, RYGBP has become the preferred procedure for bariatric surgery, at least in North America. The second major trend is the emergence of laparoscopic procedures, performed in only 3% of cases in 1999, but this number is likely to increase dramatically in the near future.

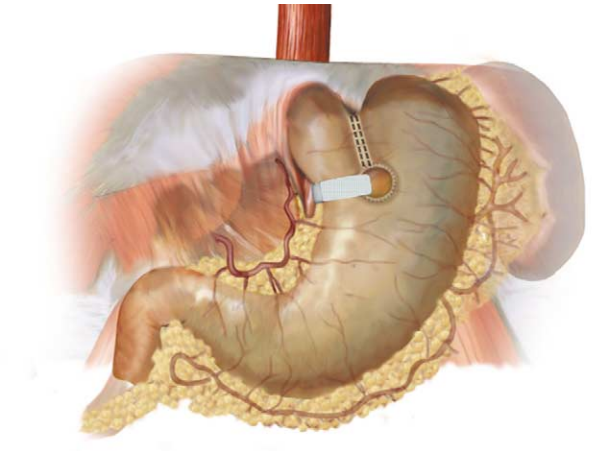

Fig. 1. Vertical banded gastroplasty. This procedure is based on gastric restriction and involves creating a small (30 to 50 mL), vertically oriented gastric pouch with a narrow outlet that is fixed by polypropylene mesh or a Silastic (Dow Corning, Midland, MI) band.

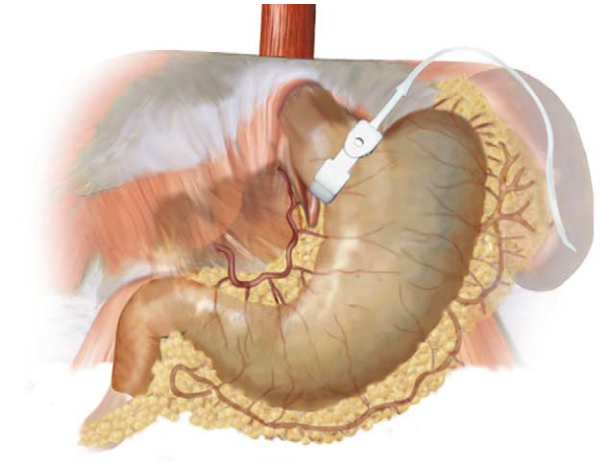

Fig. 2. Laparoscopic adjustable gastric banding (LAP-BAND). This procedure relies on gastric restriction. An inflatable silicone band is placed around the gastric cardia to achieve a 15-mL gastric pouch with an adjustable outlet that is determined by the volume of fluid inserted into the band reservoir.

Gastroplasty results

VBG, described first by Mason in 1982 [24] (Fig. 1), is the most common variety of gastroplasty and formerly the most commonly performed bariatric procedure in the United States. It is performed less frequently today, perhaps be-

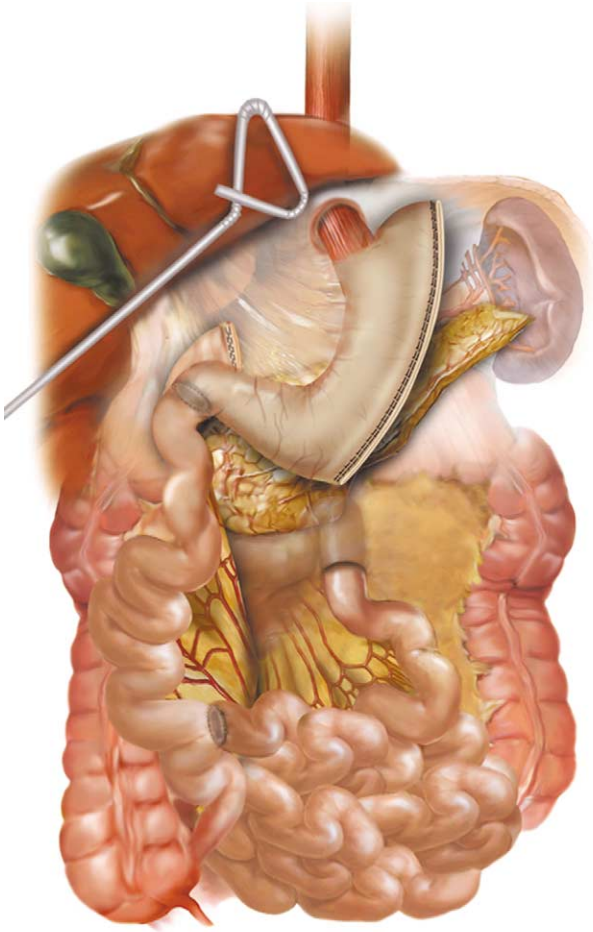

Fig. 3. Biliopancreatic diversion with duodenal switch modification (BPD-DS). Both BPD (not shown) and BPD-DS are primarily malabsorptive procedures with a common ileal food channel of 50 to 100 cm. The gastric reservoir has a 200- to 250-mL capacity, which is much larger than that used in gastric bypass. BPD-DS preserves the pyloric outlet by creating a tubularized stomach, whereas BPD involves a hemigastrectomy and gastroenterostomy.

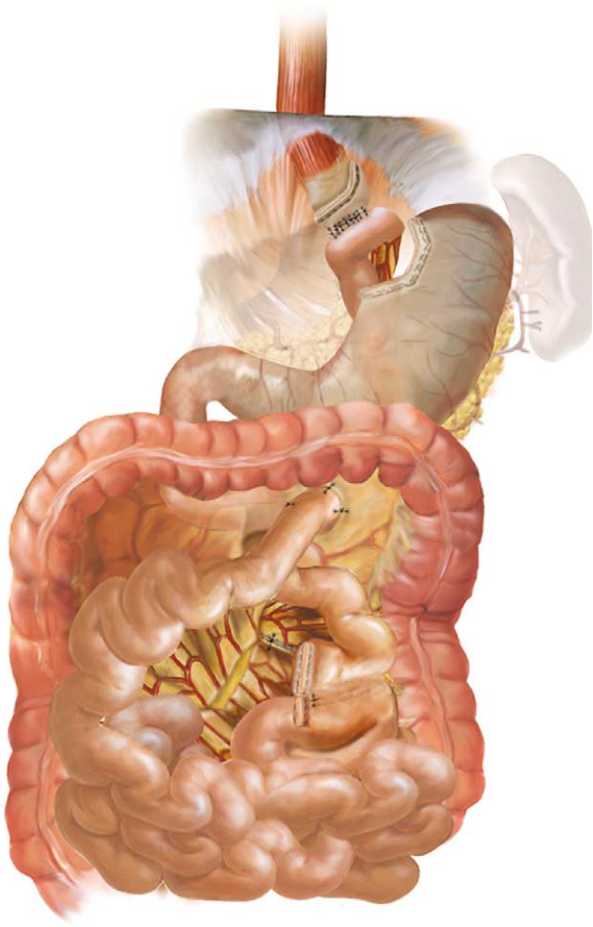

Fig. 4. Open or laparoscopic Roux-en-Y gastric bypass (RYGBP). This procedure uses gastric restriction and elements of malabsorption. It involves creation of a small gastric pouch (15 mL) and foregut bypass generally using a 75- to 150-cm Roux-limb of jejunum connected by a gastrojejunostomy and enteroenterostomy.

cause of less favorable long-term weight loss and side effects, including gastroesophageal reflux and solid food intolerance [22,23]. Gastroplasty procedures demonstrate successfully maintained weight loss in 40% of patients after 3 to 5 years (with success defined as ≥50% excess weight loss [EWL] at the time interval reported). Average EWL at 3 to 5 years appears to be 30% to 50% [23,25]. One exception to this is a report by Eckhout and colleagues [26], who found an average 63% EWL at 5 years. Other studies with long-term follow-up showed a reduction in success rate with time [22,23,25]. Laparoscopic approaches to VBG result in reduced perioperative morbidity [27,28] with similar weight loss results.

Gastric banding results

Gastric banding is not new, having been performed in the United States and Europe since 1978 [29]. Szinicz and Schnapke first described an adjustable gastric band in 1982 [30], and Kuzmak described his silicone adjustable device in 1984 [31]. It was only when Belachew and others reported their experience with laparoscopic adjustable gastric banding using the LAP-BAND that this approach became popular [32–35] (Fig. 2). These studies collectively demonstrate a 40% to 60% mean EWL at 3 to 5 years. Mean hospital stay is <2 days, and recovery is rapid. Operative mortality is rare. In several large series (2 with >700 patients each) from Belgium [36], Italy [37], and Australia [35], mortality rates of 0% to 0.1% were reported. However, an Italian multicenter study of 1,265 patients reported a postoperative mortality of 0.55% (7 deaths, but only 2 reported occurring within 30 days of surgery) [38]. Major complications are uncommon, with band slippage (2.2% to 10%) [37–39], port complications (1% to 11%) [34, 37], and band erosion (0.3% to 1.9%) [38–40] the most frequently reported complications that may require reoperation [35–38]. Gastric banding is performed almost exclusively using the laparoscopic approach. LAP-BAND surgery has become the most commonly performed bariatric operation outside the United States, particularly in Europe, Australia, and Latin America.

Table 3
Outcomes for open Roux-en-Y gastric bypass: selected series

	N	Patient size (BMI, kg or % IBW)	OR time (min)	Hospital stay (day)	Early complication rate (%)	Mortality (%)	PE rate (%)	Leak rate (%)	Hernia (%)	Follow-up (mo)	Weight loss
Mason et al, 1969 [43]	26	42	—	—	19	7.7	3.4	0	11.5	12	43 kg
Griffen et al, 1981 [44]	402	134 kg	—	—	4.2	0.75	0.25	5.47	3.5	6	35 kg
Linner 1982 [45]	174	126 kg	—	—	10.4 (all)	0.57	0	0.57	0	24	64% EWL
Sugerman et al, 1989 [46]	182	213%	—	6–7*	—	1	0	1.6	18*	12	67% EWL
Hall et al, 1990 [47]	99	198%	120	8	20	0	3	0	2	36	67% lost >50% EBW
Brolin et al, 1992 [48]	90	62	—	—	5	0	1.1	0	6.6	43	64% EWL
MacLean et al, 1993 [49]	106	50	—	—	—	0	—	5.6	—	33	58% lost >50% EBW
Pories et al, 1995 [50]	608	50	—	5–6*	25.5	1.5	—	—	23.9	168	49% EWL
Capella and Capella, 1996 [51]	560	52	—	—	1	0	0	0†	—	60	62% EWL
Fobi et al, 1998 [52]	944	46	—	4*	2.7	0.4	0.6	3.1	4.7	24	80% EWL
MacLean et al, 2000 [53]	243	49	—	—	—	0.41	—	—	16	66	BMI 44→29‡

Table reproduced from Ann Surg 2000;232:515–529 [18]. Reprinted with permission. BMI = body mass index; EBW = excess body weight; EWL = excess weight loss; IBW = ideal body weight; PE = pulmonary embolism.
* As reported by the investigator, without mean and standard deviation of the mean.
† One subphrenic abscess.
‡ Change in BMI for patients with initial BMI 40–50.

There have been few publications describing the US experience with the LAP-BAND, which has been the subject of a 3-year multicenter FDA trial, culminating in FDA approval in June 2001. Rubenstein recently reported significant resolution of comorbidities and 53% EWL at 3 years in the cohort of patients in his trial [41], and DeMaria and colleagues reported only 41% EWL in their cohort [42]. Both studies found a significant number of patients who required band removal: 9 of 63 (14.3%) in Rubenstein's report and 15 of 36 (41%) in the study from DeMaria and colleagues. EWL observed in Rubenstein's series matches that reported in the rest of the world, whereas results in the DeMaria cohort have raised questions about the potential efficacy of the LAP-BAND (see Ren and coauthors in this issue for a discussion of FDA vs international results [41]). Recent improvements in operative technique have reduced the occurrence of complications such as gastric prolapse. The LAP-BAND system is the only laparoscopic adjustable gastric band that has been approved by the FDA for use in the United States.

RYGBP results

Table 3 demonstrates selected series of open RYGBP, published primarily over the past decade, with key outcome parameters [43–53]. These studies varied considerably regarding which outcome parameters were reported. Collectively, the studies suggest that open RYGBP results in a hospital stay ranging from 4 to 8 days with a perioperative complication rate of 3% to 20% and a mortality rate of about 1%. The most common major complications occurring early (<30 days) included pulmonary embolus (up to 3.4%) and gastrointestinal leak (up to 5.6%). Anastomotic stricture (not listed in the table) was seen in up to 10% of patients. Common late complications included hernia (up to 24%). Marginal ulcers (up to 10%) and bowel obstructions (up to 3%) also have been reported (not listed in the table). Vitamin B_{12} deficiency and iron-deficiency anemia are the most common nutritional sequelae after GBP, although both can be prevented with supplementation in most patients. Significant protein malnutrition is extremely rare in the absence of infection, obstruction, or other medical disorders. Long-term (5 to 14 years) EWL appears to be 49% to 62%. Pories and colleagues [50] reported some of the best GBP results, demonstrating a nadir weight loss of 65% excess body weight at 2 years, with an approximate 15% weight regain over 14 years (weight appears to stabilize at 14 years). RYGBP has been directly compared only with VBG. The majority of prospective comparative studies show significantly better weight loss with RYGBP compared with VGB [23,47–49].

The laparoscopic approach to RYGBP (Fig. 4) was introduced by Wittgrove and Clark in the early 1990s, and has since rapidly been adopted by many surgeons [18,54,55]. Multiple studies have demonstrated advantages of the laparoscopic approach in reducing perioperative morbidity and recovery compared with open RYGBP [18,19,56]. The laparoscopic approach does have a steep learning curve, as indicated by a higher rate of technical complications for surgeons in their early experience [18,54,55,57]. In particular, gastroenterostomy leaks and internal hernia leading to bowel obstruction appear to be more common in the laparoscopic approach compared with open RYGBP but tend to decrease to equivalent rates with increased experience [58]. The most obvious benefit of the laparoscopic approach is the dramatic reduction in wound-related complications, especially incisional hernias. Weight loss after laparoscopic

RYGBP appears to be equivalent to weight loss after the open approach, although few long-term studies involving laparoscopic RYGBP have been reported.

Malabsorption procedures and their results

BPD, originally advocated by Scopinaro et al [59,60], was later modified by Hess and Hess [61] and Marceau et al [62] by adding the duodenal switch and converting the gastric resection from a generous antrectomy to a greater curve sleeve resection (Fig. 3). The DGBP differs primarily by using a smaller gastric pouch [63]. Excellent long-term weight loss—up to 78% EWL at 18 years—has been reported with BPD [64]. The mortality rate of BPD is 1%, and the rate of major morbidity is 20% to 25%. The most common complications include hernia (10%), ulcer (8% to 12%), bowel obstruction (1%), wound infections (1%), wound dehiscence (1%), venous thrombosis (0.5%), and pulmonary embolus (0.5%). Late nutritional complications include anemia (5% to 40%) and protein malnutrition (7% to 12%). Potential advantages of the duodenal switch variation include reduced incidence of protein malnutrition and ulcer rate, although these advantages are subject to considerable debate. Although not considered a complication, alteration in bowel activity characterized by 3 to 5 loose, foul-smelling (steatorrhea) bowel movements per day is typical. Laparoscopic approaches to BPD have been reported, but experience is too limited to make strong conclusions about their role [65].

Risk-benefit comparison of bariatric procedures

There are essentially no randomized comparative studies evaluating the relative risk and benefit of each of the surgical options described above, with the exception of VBG vs RYGBP [23,47,49]. Furthermore, long-term results (>5 years) are not abundant for any of the bariatric procedures. Thus, the quality of evidence to guide operative choice by surgeon and patient is fair at best, based primarily on single-institution case series.

Nevertheless, operative selection must be made based on the best available evidence. In general, the data suggest that approaches with the least apparent risk, such as the LAP-BAND procedure, appear to generate the least weight loss. BPD and the other malabsorption options appear to have the greatest risk but probably result in the best sustained weight loss. In terms of risk-benefit, RYGBP lies somewhere between the restrictive procedures and malabsorption procedures. Operative selection should thus take into consideration these relative differences in risk-benefit, which are issues that should also be explained clearly to the patient. However, ECRI (Plymouth Meeting, PA; formerly the Emergency Care Research Institute), an independent, nonprofit health services research agency that evaluates emerging medical technologies, recently reviewed the existing literature on these 5 bariatric surgical procedures—gastroplasty, gastric banding, RYGBP, DGBP, and BPD [66]. This critical appraisal of the literature found no significant differences in outcome in patients undergoing these procedures. More prospective, controlled studies are needed before strong conclusions can be made regarding the most appropriate operation for a given patient.

Summary

Nonsurgical options may be helpful in the treatment of mild to moderate obesity but generally fare poorly when used in the treatment of severe obesity. Surgical options with acceptable risk and benefit include gastroplasty (VBG), adjustable gastric banding, RYGBP, BPD with or without duodenal switch, and DGBP. Current data suggest that short-term (3 to 5 years) EWL varies from 40% to 50% for the restrictive procedures, from 60% to 70% for RYGBP, and from 75% to 80% for the BPD/malabsorption procedures, with corresponding reduction in comorbidity. Abundant long-term weight loss data are lacking for nearly all these procedures. Laparoscopic approaches appear to reduce perioperative morbidity and recovery but require increased surgeon training. Currently, RYGBP is the preferred approach in the United States and LAP-BAND surgery is the preferred approach outside the United States. More scientific appraisals comparing different procedures, and open and laparoscopic approaches, are needed.

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