

Psychosocial and Behavioral Status of Patients Undergoing Bariatric Surgery: What to Expect Before and After Surgery

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Extreme obesity, characterized by a body mass index (BMI) of 40 kg/m² or greater, is associated with significantly increased mortality, principally from cardiovascular disease, type 2 diabetes, and several cancers [1,2]. It also is associated with an increased risk of psychosocial complications, including depression, eating disorders, and impaired quality of life [3–5]. This article briefly examines the psychosocial status of extremely obese individuals who seek bariatric surgery and describes changes in functioning that can be expected with surgically induced weight loss. The article combines a review of the literature with clinical impressions gained from the more than 2500 candidates for bariatric surgery whom we have evaluated at the Hospital of the University of Pennsylvania.

Mood and anxiety disorders

Psychiatric status varies greatly among persons who seek bariatric surgery [3–7]. A majority have essentially normal psychosocial functioning; however, approximately 25% to 30% of patients report clinically significant

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symptoms of depression at the time of evaluation for surgery [3,5,8]. Studies that have used a structured, clinical interview have found that about 50% of candidates report a lifetime history of mood disorders (including major depression or dysthymia) or of anxiety disorders (including generalized anxiety disorder or social phobia) [3–7].

Methodologic limitations, including the absence of well defined control groups and the use of suboptimal psychometric measures, prevent definitive interpretation of the rates of psychopathology observed in bariatric surgery candidates. Patients encountered in medical and surgical clinics generally report higher rates of depression and anxiety than persons in the general population [9], potentially because of the emotional distress associated with the physical complications that lead patients to seek medical attention. A recent population study of nearly 40,000 individuals found that persons who had a BMI of 40 kg/m² or higher were nearly five times more likely to have experienced an episode of major depression in the past year than were individuals of average weight [10]. This finding strongly suggests that extremely obese individuals are more vulnerable to depression, although the factors responsible for this susceptibility are not clear. Contributors may include the weight-related prejudice and discrimination to which severely obese individuals are subjected [11,12] and the presence of bodily pain [13]. Binge eating disorder (BED) is also associated with increased depression [3,5,8,14,15].

Management of psychiatric complications before surgery

Preoperative depression levels and other forms of psychopathology do not consistently predict weight loss after bariatric surgery [3,5]. Investigators originally expected that psychopathology would be associated with suboptimal weight loss, but some studies found greater weight loss in patients who had depression or a history of psychiatric treatment [16–19]. In summarizing the literature, Herpertz and colleagues [16] concluded that negative affect that is related to patients' distress about their obesity may facilitate weight loss after surgery. By contrast, major depression or other psychopathology, which occurs independent of body weight, may be associated with suboptimal outcomes, including medical complications. This hypothesis merits further study.

The finding that preoperative psychiatric status does not consistently predict weight loss has led some to question the need for a psychosocial evaluation [20]. We believe that such assessment is imperative given the frequent occurrence of clinically significant depression (and other disorders) that requires behavioral or pharmacologic intervention to relieve the patient's suffering. Thorough preoperative care should include the treatment of depression. Practitioners are advised, at a minimum, to screen for depression by using a brief interview [8,21,22] or a paper-and-pencil questionnaire such as the Beck Depression Inventory [23]. Candidates for bariatric surgery

should be assessed by a mental health professional who has expertise in obesity and is a member of the perioperative team [24]. Although weight loss generally improves mood, it is not a primary treatment for major depression or other psychiatric conditions [16,21]. Thus, psychiatric care should not be delayed in expectation that weight loss will resolve significant mental health problems [16].

Changes in mood and anxiety after bariatric surgery

The Swedish Obese Subjects (SOS) study provides the best evaluation of changes in mood and anxiety after bariatric surgery [25]. This trial included a carefully matched control group that received traditional diet and exercise counseling. Depression scores fell significantly more at 1 year in surgically treated than in control patients (40% versus 10% reductions, respectively). Similar improvements were observed in anxiety (Fig. 1). At 2 years, mean weight loss, which was induced primarily by vertical banded gastroplasty, was approximately 23% of initial weight. At this time and at a 4-year follow-up evaluation, mood and anxiety levels tended to increase slightly from their 1-year levels [25,26]. Larger weight losses at both times were associated with greater improvements in depression and anxiety [25,26]. Dixon and colleagues [27] reported similar improvements in depression after a 20% reduction in initial weight achieved with laparoscopic adjustable banding.

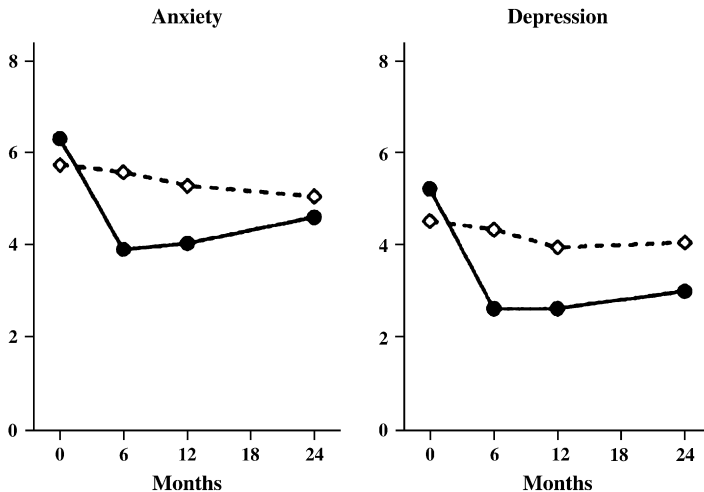


Fig. 1. Participants in the SOS study reported significantly greater decreases in depression and anxiety in the year after surgery than control subjects (*circle*, surgery patients; *square*, control subjects). (From Karlsson J, Sjostrom L, Sullivan M. Swedish obese subjects (SOS): an intervention study of obesity. Two-year-follow-up of health-related quality of life (HRQL) and eating behavior after gastric surgery for severe obesity. *Int J Obes Relat Metab Disord* 1998;22:113–26; with permission.)

The mean presurgical score of 17.7 on the Beck Depression Inventory indicated mild symptoms of depression. One year after surgery, this value fell to 7.8 and remained at 9.0 at 3-year follow-up. These values indicate minimal symptoms of depression.

Risk of suicide in persons who have extreme obesity

The positive findings from these two well conducted studies confirm results from several, smaller uncontrolled investigations (summarized in Refs. [3–6]). Although these findings indicate that bariatric surgery is unlikely to be associated with adverse psychosocial consequences, studies typically have reported only group outcomes and not changes in individual patients. Persons who, before surgery, have a chronic history of major depression or dysthymia may continue to have these problems after surgically induced weight loss [16], despite the favorable changes in mean (ie, group) scores. Moreover, case reports have suggested that patients undergoing bariatric surgery may have a higher-than-expected rate of suicide [28–31]. Factors responsible for this potentially increased risk are not well understood but likely are associated with the emotional burden of extreme obesity [3–5,10,11]. Dong and colleagues [32] recently reported that the risk of attempted suicide in persons who had a BMI of 40 to 49.9 kg/m² was 87% greater than that in persons in the general population; a BMI of 50 kg/m² or higher was associated with a 122% increased risk. Individuals studied by Dong and colleagues were not candidates for bariatric surgery, thus suggesting that extreme obesity, rather than weight loss surgery alone, increases the risk of suicide. Two other population studies have reported similar findings [10,33]. A case report by Omalu and colleagues [34] suggested that a history of major depression may increase the risk of suicide in persons who undergo bariatric surgery. Each of three individuals who took their lives had a history of severe depression before surgery that persisted postoperatively despite their maintaining losses of 25% to 41% of initial weight at the time of death (which occurred 12–27 months after surgery). These findings underscore the importance of ensuring that patients who have psychiatric disorders receive appropriate mental health care before and after bariatric surgery. More research is needed on the relationships among extreme obesity, depression, surgically induced weight loss, and suicidal behavior.

Eating disorders

Binge eating disorder

Eating disorders are common in patients undergoing bariatric surgery [3–5]. Approximately 10% to 25% of patients suffer from BED, which is characterized by the consumption of an objectively large amount of food in a brief period (<2 hours), during which the individual experiences subjective loss of control [35–39]. Binge episodes cause significant emotional

distress. They are not followed by purging (eg, vomiting), which distinguishes BED from bulimia nervosa [35,39]. The presence of BED is associated with increased symptoms of depression, with mean scores for binge eaters falling in the mild to moderate range on the Beck Depression Inventory [3–5,8,14], compared with minimal symptoms of depression for comparably obese individuals without BED. Table 1 summarizes the results of five studies that found that approximately 50% of patients who had BED reported a lifetime history of major depression [14,15,40–43]. Personality disorders, including borderline and narcissistic personality disorder, were common.

Patients tend to over-report the presence of BED. The administration of a semistructured interview results in lower prevalence rates (ie, 5–15%) than does the use of paper-and-pencil questionnaires (ie, estimates as high as 50%) [44]. Thus, patients should be interviewed to confirm that they eat a large amount of food and experience loss of control. Criteria for BED are shown in Box 1.

Night eating syndrome

Approximately 5% to 20% of bariatric surgery candidates also meet criteria for the night eating syndrome (NES) [44–46], which is characterized by the consumption of 35% or more of daily calories after the evening meal [14,47,48]. Patients report frequent nocturnal awakenings, at which time they snack as a means of returning to sleep. This syndrome, like BED, is associated with increased symptoms of depression. NES may be diagnosed using criteria proposed by Allison and Stunkard [14,44].

Table 1
Percentage of BED patients with lifetime comorbidity of DSM diagnoses, as assessed by SCID

Study	Major depression	Any substance abuse or dependence	Any anxiety disorder	Any axis I disorder	Personality disorder
Yanovski et al., 1993	51	12		60	35
Specker et al., 1994	47	72	11.6	72.1	33
Mussel et al., 1996	47	23	18.8	70	
Telch & Stice, 1998	49	9		59	20
Willfley et al., 2002				63	31

Reprinted from Allison KC, Stunkard AJ. Obesity and eating disorders. Psychiatr Clin North Am 2005;28:55–67.

Box 1. Proposed diagnostic criteria for binge eating disorder

Episodes of binge eating are recurrent and are characterized by the following:

Eating, during a discrete period of time (eg, within any 2-hour period), a quantity of food that is definitely larger than most people would eat during a similar period of time under similar circumstances

A sense of lack of control during the episodes (ie, a feeling that one cannot stop eating or control what or how much one is eating)

Episodes of binge eating are associated with at least three of the following behavioral indicators of loss of control:

Eating much more rapidly than usual

Eating until feeling uncomfortably full

Eating large amounts of food when not feeling physically hungry

Eating alone because of being embarrassed by how much one is consuming

Feeling disgusted with oneself, depressed, or very guilty after overeating

Person feels marked distress regarding binge eating.

Binge eating occurs, on average at least 2 d/wk over a 6-month period.

Binge eating is not associated with regular use of inappropriate compensatory behaviors (eg, purging, fasting, or excessive exercise) and does not occur exclusively during the course of anorexia nervosa or bulimia nervosa.

Effect of eating disorders on postoperative weight loss

Several studies have suggested that the presence of BED before surgery is associated with suboptimal weight loss [5,16,49,50], potentially because of poor adherence to the postoperative diet. In addition, binge eating, whether present preoperatively or not, has been observed in patients who regained weight after achievement of their maximal weight loss with surgery, typically at 18 months [51,52]. These findings, however, have been contradicted by at least four studies that found no differences in weight loss between patients with and without BED [46,53–55]. In addition, all of these studies had methodologic limitations that included small sample sizes, short follow-up assessments, or the retrospective assessment of preoperative binge status [3,5]. Given the absence of definitive data, surgeons and mental health professionals are uncertain whether patients who have BED should be referred

for treatment of binge eating before undergoing surgery or should proceed directly to surgery [21,24,56].

Effects of bariatric surgery on binge eating and appetite

Although the presence of BED may limit weight loss after bariatric surgery, the gastric bypass procedure (GBP) may, nonetheless, improve eating-disordered behavior and appetite. In two studies by Hsu and colleagues [49,50], no patients who had BED before surgery reported binge eating postoperatively. Their small pouch size prevented them from consuming objectively large amounts of food. The cessation of binge eating has been reported by others [16,46,57]. Approximately 20% of patients reported subjective binge episodes in which they experienced subjective loss of control of food intake, despite not eating a large amount [49,50]. Such episodes may be associated with smaller weight loss, as suggested by Kalarchian and colleagues [57]. Further study of this issue is needed.

Appetite control

GBP induces weight loss primarily by mechanical restriction of food intake. Patients initially can eat only 1 to 2 oz of food at a sitting because of their small pouch size. They report feeling full more quickly (ie, satiation) and experiencing less hunger (ie, the desire to initiate eating) [25,58]. Reduced hunger after GBP seems to be related to decreased levels of ghrelin, an orexigenic hormone that is secreted primarily by the stomach and acts on hypothalamic neurons (ie, neuropeptide Y and agouti-related protein) that are potent stimulators of food intake [59,60]. As reported by Cummings and colleagues [59], “plasma ghrelin levels rise shortly before and fall shortly after each meal, a pattern that is consistent with a role in the urge to eat.” These investigators demonstrated that weight loss after GBP was associated with marked reductions in plasma ghrelin rather than with the increase in this peptide observed after weight loss by diet and exercise. These findings led Cummings and colleagues [59] to conclude that gastric surgery is associated with decreased levels of circulating ghrelin and, thus, the reductions in postoperative hunger. GBP also may increase levels of GLP1 and PYY, each of which inhibits food intake [61]. Thus, GBP seems to induce weight loss, in part, by altering the neuro-endocrine regulation of food intake.

Adjunctive counseling for eating disorders

Further research is needed on the effects of eating disorders, including NES, on the outcome of bariatric surgery. Until such data are available, our research team recommends asking patients who have BED how concerned they are about their potential inability to control their binge eating after surgery [21]. We refer for cognitive behavioral treatment, before surgery, individuals who express significant anxiety or worry about binge eating; most do not. We instruct all patients to work closely with our program’s dietitians before

and after surgery and to contact them postoperatively whenever they feel they are eating too much or experiencing subjective loss of control of their food intake.

Quality of life

Extreme obesity almost universally results in decreased health-related quality of life (HRQL). This term refers to the burden of suffering and the limitations in physical, vocational, and social functioning associated with illness [62]. HRQL may be assessed by disease-specific measures, which seek to isolate the effects of a single illness (eg, diabetes-related quality of life), or by general measures, which do not reference a particular disease or condition. The Medical Outcomes Survey, Short Form 36 (SF-36) is the most commonly used instrument for assessing the impact of general health on daily functioning [63]. Frequently used obesity-specific instruments include the Impact of Weight on Quality of Life (IWQOL) scale and its short form, the IWQOL-Lite [64,65].

Regardless of the type of measure used, numerous studies have shown that excess weight is associated with significant impairments in HRQL and that the severity of impairment is related to the severity of obesity [13,66,67]. Thus, candidates for bariatric surgery report significantly worse HRQL than their less obese counterparts who seek behavioral and pharmacologic weight loss interventions [68]. Patients frequently report that the pervasiveness and severity of their impairments are their strongest motivators for seeking bariatric surgery. Additionally, impairments in HRQL may account for increased symptoms of depression among bariatric surgery candidates [13].

The large weight loss produced by bariatric surgery is associated with significant improvements in weight-related comorbidities, including type 2 diabetes, hypertension, and dyslipidemia [69]. As a result, patients undergoing bariatric surgery report significantly fewer impairments in HRQL postoperatively than similarly obese individuals who receive nonsurgical treatment [25,70]. We briefly review several areas of functioning that seem to be favorably affected by weight loss after bariatric surgery.

Physical function

The strain of carrying excess weight can impede even the most basic physical functions and personal care tasks [71,72]. Numerous investigations have found that extremely obese individuals report significant impairment in performing activities such as walking, climbing stairs, bathing, and dressing [71,72] and that such difficulties are among the most distressing aspects of their obesity [73]. The large weight losses achieved with bariatric surgery seem to normalize physical function and other aspects of quality of life. Nguyen and colleagues [74], for example, found that patients' physical

function was significantly impaired before their undergoing open or laparoscopic gastric bypass. At 3- and 6-month postoperative assessments, physical function had improved to that of the general population. These patients had a mean preoperative BMI of approximately 48 kg/m² (range, 40–60 kg/m²). O'Brien and colleagues [70] studied less obese patients (mean BMI, 33.7 kg/m²; range, 30–35 kg/m²) who underwent laparoscopic adjustable gastric banding. Patients' scores on all SF-36 scales fell in the significantly impaired range at baseline but rose to meet or exceed normative levels 2 years after surgery after a 22% reduction in initial weight. Physical functioning scores improved significantly more in surgically treated patients than in participants in this study who were randomly assigned to a program of very-low-calorie diet, pharmacotherapy, and behavior modification, which produced a 2-year loss of only 5.5% of initial weight [70].

A 1-year prospective study of patients undergoing bariatric surgery showed the extent to which mobility and functional capacity improved with weight loss [75]. Fifteen extremely obese women completed a 6-minute walk test before and 1 year after undergoing laparoscopic adjustable gastric banding. The investigators instructed participants to cover as much distance as possible during the assessments and measured heart rate, oxygen saturation, and perceived exertion before and after each test. As compared with their preoperative assessments, participants covered nearly one third more distance postoperatively and showed significant reductions in pre- and post-walk heart rate and perceived exertion. Increased capacity and ease of walking likely accounted for some of the improvements in physical function observed postoperatively.

Weight loss and improvements in physical function also may be associated with significant reductions in weight-related pain and correction (or improvement) of weight-related postural abnormalities that limit mobility. The SOS study found that "work-restricting" pain in the neck, back, hips, knees, and ankles and effort-related calf pain were significantly more common among obese persons than among the general population [76,77]. Patients who underwent bariatric surgery reported significantly greater improvement (or resolution) in these types of pain over 2 years than did similarly obese control subjects who received nonsurgical treatment. Surgically treated patients were significantly less likely to develop such pains. The reduction of pain in weight-bearing joints, such as the knees and ankles, seems to be more durable than the relief that patients initially report in their lower backs and non-weight-bearing body areas. Improvement in the former areas can be observed at least 6 years after bariatric surgery [76].

Occupational function

Persons who have significant limitations in their functional abilities and mobility could be expected to have impaired occupational function. Additionally, pervasive weight-related stigma may limit the occupational

opportunities of extremely obese individuals [11]. Bariatric surgery candidates have reported significant preoperative and postoperative improvements in work-related activities. Two reviews found clear evidence of improvements in employment, as well as in job status, performance, and satisfaction after bariatric surgery [4,6].

The effect of bariatric surgery on missed work time is complex. Surgically treated participants in the SOS study had 35% more sick days in the year after treatment than patients in the control group [78]. The increased rate in patients undergoing bariatric surgery was likely attributable to recovery from the operation. In years 3 and 4, however, the surgically treated patients had significantly fewer days of sick leave, with the greatest effect observed among older (ie, 47–60 years of age) patients. Such data have not been reported for patients in the United States or Canada.

Body image and marital and sexual function

Body image dissatisfaction is common in overweight and obese individuals [3,5]. As early as 1967, Stunkard and Mendelson [79] described a group of obese patients with body image “disparagement” who believed their bodies were “ugly and despicable” and that others viewed them with hostility and contempt. Their body image disparagement took the form of an overwhelming preoccupation with their obesity, often to the exclusion of any other personal characteristics. More recently, Sarwer and colleagues [80] observed a similar phenomenon in 8% of obese individuals who enrolled in a clinical trial. This subset of individuals met criteria for body dysmorphic disorder, defined as a preoccupation with an imagined or slight defect in appearance that causes clinically significant distress or impairment in social, occupational, or other areas of functioning [81]. Patients who had this disorder scored an average of 13.2 on the Beck Depression Inventory (indicative of mild depression), compared with normal scores (ie, mean of 7.2) for patients who reported body image dissatisfaction but did not meet criteria for body dysmorphic disorder. Neither Stunkard’s nor Sarwer’s patients were candidates for bariatric surgery, and only a minority of surgery candidates present with body image disparagement of this degree.

Numerous studies have reported that weight loss after bariatric surgery is associated with marked improvements in body image [5,13,64–66,81]. An early study by Halimi and colleagues [82], found that 70% of patients reported severe body image disturbance before surgery, which fell to 4% after weight loss. Adami and colleagues [83] reported that 3 years after surgery, patients’ scores on the Body Image Dissatisfaction subscale (of the Eating Disorders Inventory) and on the physical attractiveness and fear of fatness subscales (of the Body Attitudes Questionnaire) improved to the point that they did not differ significantly from values for normal weight-control subjects. Amelioration of body image is likely to be associated with improved social functioning as it was in the SOS study [25]. At a 2-year assessment,

surgically treated patients reported that they were significantly less troubled than control participants by events such as going to restaurants or community activities, shopping for clothes, or being seen in a bathing suit. They also reported significantly greater satisfaction with personal relationships.

Marital and sexual function

Many patients present for bariatric surgery with the expectation that weight loss will improve their marital and sexual relationships, whereas others fear that changes in their weight and body shape may destabilize these relationships [3,5]. There have been few empirical studies of this issue, but most of the evidence suggests that improvements in relationship quality and satisfaction are more likely to improve than deteriorate [4–6]. Additionally, the effect of surgery seems to be a function of the quality of the existing relationship [84]. Postoperative marital problems are more likely attributable to a poor preoperative relationship than to the effects of the surgery. Nonproblematic relationships seem to remain stable or to improve.

Sexual function

Little is known about the effects of surgically induced weight loss on sexual function and satisfaction. Extremely obese persons report greater impairments in sexual quality of life than their less obese counterparts [85], and obese individuals—particularly women—seem to be stigmatized as potential sexual partners [86]. Additionally, researchers have shown obesity-related metabolic abnormalities were associated with sexual dysfunction and that erectile function improved in about one third of men who lost weight with lifestyle modification [87,88]. Given these findings, sexual quality of life in extremely obese men (and perhaps women) could be expected to improve after bariatric surgery. Controlled studies are needed to test this hypothesis.

Clinical concerns

The last section of this article addresses clinical problems for which there has been limited systematic research. These problems include (1) suboptimal weight loss, (2) vomiting and plugging, (3) gastric dumping, and (4) plastic surgery after weight loss. These problems are likely to attract more research attention with the continued growth of bariatric surgery.

Suboptimal weight loss

Patients typically lose 25% to 30% of initial body weight with GBP and 20% to 25% with restrictive procedures within the first 2 years postoperatively [69,89–93]. Approximately 20% of patients fail to obtain these losses [90,92,94]. Others begin to regain large amounts of weight within the first

few postoperative years. These suboptimal results typically are attributed to poor adherence to the postoperative diet.

Several studies have suggested that patients struggle to adhere to the rigors of the postoperative diet [95–98]. Caloric intake often increases significantly over time [92,95,99–101]. For example, in the SOS trial [94], patients consumed approximately 2900 kcal/d before surgery. Their intake decreased to 1500 kcal/d 6 months after surgery but increased to approximately 2000 kcal/d 10 years later. This increase in caloric intake suggests the possible benefit of pre- or postoperative dietary counseling, particularly to improve adherence to the postoperative diet, thus maximizing weight loss. Such counseling makes intuitive sense, and investigations of its potential efficacy are in progress.

Vomiting and plugging

One third to two thirds of patients undergoing bariatric surgery report postoperative vomiting [46,52,102–107]. Vomiting is thought to occur most frequently during the first few postoperative months [108] but has been reported to occur for several years postoperatively [29,52,104,109,110]. This vomiting, whether reflexive or self-induced, does not seem to be a purging behavior (as seen in bulimia nervosa). Patients may vomit in response to intolerable foods or in an effort to clear food that has become lodged in the upper digestive track. This latter event, referred to as plugging, is typically the result of overeating, particularly of pasta, bread, and dry meats [46,52,103]. It has been reported in as many as 43% of patients for as long as 15 years postoperatively [52]. Although patients often attribute their vomiting to a physiologic problem, anecdotal reports suggest that vomiting is usually the result of consuming large portions or incomplete chewing of food. If physiologic causes for excessive vomiting have been ruled out, dietary counseling is recommended.

Gastric dumping

Gastric dumping, which encompasses a variety of symptoms including nausea, flushing, bloating, faintness, fatigue, and (often) severe diarrhea, may be the most undesirable postoperative event [52,92,93]. Patient reports suggest that it usually occurs after the consumption of foods high in sugar. These unpleasant symptoms should “encourage” patients, by means of aversive conditioning, to limit the intake of cakes, cookies, ice cream, and other sweets.

Despite its untoward symptoms, the occurrence of dumping has not been well documented. Studies suggest that it occurs in 50% to 70% of patients undergoing GBP [93,111]. Anecdotal reports suggest that it may not occur in all patients or may occur temporarily during the postoperative period [30].

Body contouring after bariatric surgery

According to the American Society of Plastic Surgeons, in 2005, approximately 68,000 patients underwent body contouring procedures after the massive weight loss typically associated with bariatric surgery [112]. The most common procedures were breast reduction procedures, which were performed on 31,277 patients. Extended abdominoplasty/lower body lift procedures, which are designed to eliminate the excessive skin around the abdomen and lower torso, were performed on 20,630 individuals. Upper arm lifts and thigh lifts were performed on 8,741 and 7,486 persons, respectively.

There is a rapidly growing body of knowledge related to the surgical aspects of these procedures [113]. Given the newness of this subspecialty within plastic surgery, we recommend that patients interested in body contouring seek treatment from board-certified plastic surgeons experienced with these challenging procedures. Little, however, is known about the psychological aspects of body contouring surgery [114]. Body image dissatisfaction is believed to play a central role in motivating people to undergo other plastic surgical procedures [115]. Patients undergoing bariatric surgery report improvements in body image after weight loss with behaviorally based programs and bariatric surgery [82,116–123]. Some patients undergoing bariatric surgery report residual body image dissatisfaction associated with loose, sagging skin of the breasts, abdomen, thighs, and arms after the massive weight loss [80,81]. This dissatisfaction likely motivates some individuals to seek plastic surgery to address these concerns.

Summary

Bariatric surgery is the most effective intervention for persons who have a BMI of 40 kg/m² or greater. It routinely induces weight losses of 25% to 30% of initial weight; such weight loss is associated with marked improvements in obesity-related comorbidities, including type 2 diabetes, hypertension, and sleep apnea. This article has shown that surgery-induced weight loss is generally associated with improvements in psychosocial status and HRQL, but changes in mental health after bariatric surgery are not as predictable as those in type 2 diabetes and related conditions. Weight loss should not be viewed as a treatment for major depression or the other significant psychiatric disorders that are observed in approximately 25% of persons who seek bariatric surgery. Researchers and clinicians are not able to predict which surgery patients will have suboptimal weight loss or suffer from clinically significant behavioral complications, including depression, binge eating, vomiting, or dumping. A minority of patients will report such problems postoperatively and will need the care of a multidisciplinary team that includes registered dietitians and mental health professionals who have expertise in weight management.

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