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CHARACTERIZATION OF EATING DISORDERS AFTER BARIATRIC SURGERY: A CASE SERIES STUDY

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Abstract

Objective—A significant number of post-bariatric surgery patients present with eating disorders (ED) symptoms that require specialized treatment. These cases are thought to be underreported due to their frequent sub-syndromal presentation. This paper describes eating disorder syndromes that develop subsequent to bariatric surgery.

Methods—The clinical charts of 12 individuals who were hospitalized on a specialized inpatient eating disorders unit were reviewed.

Results—Based on the new DSM-5 proposed criteria, six patients would meet criteria for an anorexia nervosa (AN) diagnosis: three with binge eating/purge AN subtype and three with restrictive AN subtype. An additional four met criteria for atypical anorexia nervosa, since they were at a normal weight, and two patients met criteria for bulimia nervosa.

Discussion—Several similarities to the classical EDs were found. The findings that most distinguished these patients from those with classical EDs were their ages, and the age of onset of the ED for some patients.

Keywords

bariatric surgery; post surgery eating disorders; DSM-5

Introduction

Bariatric surgery (BS) is now recognized as the most effective treatment for severe obesity, and usually results in improvement or resolution of the medical and psychosocial comorbidities associated with morbid obesity.^{1,2} However, research has shown that eating pathology is commonly seen in bariatric surgery patients before surgery, and may persist or emerge after surgery.³⁻⁶ Much of this research has focused on binge eating disorder, “loss of control” eating, and other maladaptive eating behaviors such as “grazing” and night eating

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syndrome, since they have been fairly consistently linked to attenuated weight loss and/or greater weight regain post-surgery.⁷⁻¹² Indeed, binge eating disorder is present in anywhere between 6-69% of such patients, depending on the method of assessment,^{13,14} and night eating syndrome is present on 1.9-42%.¹⁴⁻¹⁸ “Grazing” and/or “picking and nibbling” have been reported at a rate of 19.5% to 59.8%^{7,19-21} depending on the method of assessment and the criteria employed. Other gastrointestinal problems have also been reported in this literature, including dumping (intense discomfort after sweet ingestions accompanied by nausea, vomiting, bloating, cramping, diarrhea, dizziness, fatigue, weakness, and sweating) and “plugging” (problems with the small opening of the stomach becoming plugged with food). These seem to relate to eating style and eating choices, and often lead to early/spontaneous vomiting after surgery, in an attempt by the patient to overcome the physical discomfort. After bariatric surgery patients often report vomiting (whether reflexive or self-induced) in response to intolerable foods, overeating, not chewing properly or even eating too fast.²² The vomiting is usually not a compensatory behavior to influence weight or shape, as will be discussed. Despite these behaviors occurring frequently among patients following restrictive bariatric surgeries, their prevalence differs across studies and with duration of follow-up, varying from 23% to 75%.^{19,23,24} A small percentage (11.9%) of patients, however, do report self-vomiting as a mean to control weight and/or shape.¹⁹

An emerging area of research is the development of traditional eating disorders (EDs) such as anorexia nervosa (AN), bulimia nervosa (BN), eating disorder not otherwise specified (EDNOS), as well as sub-syndromal eating disorders, in patients after they have undergone surgery.

The case reports and case series literature in this area were recently reviewed,³ and the authors suggested that the emergence of eating pathology after bariatric surgery is likely underreported and misidentified in clinical settings. Marino and colleagues (2012) argued that this might be explained to some extent by the lack of an appropriate nomenclature to classify sub-syndromal cases, and the great heterogeneity across cases documented in the literature. A new eating disorder - post-surgical eating avoidance disorder - has even been suggested as well to capture the specificities of these sub-syndromal diagnoses.⁴

In the DSM-5,²⁵ the criteria for the classical eating disorders are being revised, and binge eating disorder is scheduled to be included in the newly labeled Feeding and Eating Disorders category. Particularly important for bariatric surgery patients is the definition of low BMI. The DSM-4 criterion for AN regarding the low body weight was altered, and the DSM-5 presents a broader definition considering the restriction of energy intake relative to requirements leading to a significantly low body weight in the context of age, sex, developmental trajectory, and physical health. Also, BMI is to be considered a severity indicator which is to be assessed in regards to the developmental stage and physical condition of the patient. For BN, the frequency of the occurrence of binge eating episodes and compensatory behaviors was altered from twice to once a week in the previous three months.

To the best of our knowledge, no data are available on the prevalence, nature or characteristics of eating disorder syndromes after surgery, but despite being considered rare conditions, they are associated with important surgical complications and significant psychological impairment.

This paper will provide further information regarding the EDs that emerge after bariatric surgery, exploring the ED symptoms reported by post-surgery patients who were hospitalized on a specialty unit for eating disorders, and classifying them using the proposed criteria for the DSM-5.

Method

We reviewed the clinical charts of patients who had undergone bariatric surgery and subsequently had received in-patient treatment on an eight bed ED specialty unit from 2008 until 2012. A total of 12 individuals who met these requirements were admitted to the treatment center over a span of the four years. Their clinical charts were reviewed by a trained research assistant to retrieve information on the designated variables of interest for this study: surgical procedure; weight history (before and after surgery); dieting history; past and current eating disordered symptoms; body image criteria; prior ED treatment; psychological comorbidities; medical and psychiatric concurrent treatment; past and current substance use; family history of psychiatric disorders and surgical complications. Since four patients were admitted repeatedly during the 4 years, for diagnostic purposes we only include information obtained during the first admission.

This study was approved by the local Institutional Review Board.

Results

Demographic characterization and weight history

The cases were all women, age 23 to 69 ($M=46.8$; $SD=16.6$). The pre-surgery Body Mass Index (BMI) ranged from 40.4 to 79.4 ($M=50.1$; $SD=11.0$), and the nadir BMI attained after surgery varied from 13.0 to 38.6 ($M=21.6$; $SD=6.9$). Four of the patients attained a nadir BMI post-surgery 18, five remained within a normal BMI (18-25), and three had nadir BMIs > 25 . BMI recorded at the time of admission varied from 13.1 to 39.6 ($M=24.5$; $SD=7.7$). BMI points lost from pre-surgery to admission ranged from 14.3 to 45.5 BMI points ($M=25.7$; $SD=9.0$).

Bariatric procedure and surgical complications

Roux-en-Y Gastric Bypass (RYGBP) was the most commonly performed surgery in this group of patients ($n=9$). One of these 9 patients had undergone RYGBP as a revision of a vertical band gastroplasty (VBG). An additional patient had received a duodenal switch. The remaining two patients underwent laparoscopic gastric band surgeries. The elapsed time between surgery and the first admission varied from 3 months to 26 years ($M=5.7$ years; $SD=7.8$).

Medical complications after surgery were reported by 50% of the patients ($n=6$) and included chronic nausea, vomiting, plugging, dumping, dysphagia, adhesions, pain, and the need for dilatation and/or revised surgery.

Eating Disorder Criteria at Admission

Eating disorder symptoms reported at admission included intense (intake < 400 kcal/day) dietary restriction ($n=10$); marked fear of weight gain and or persistent behaviors that interfere with weight gain ($n=10$); binge eating at least once a week in the previous 3 months ($n=3$); and undue influence of body weight or shape on self-evaluation ($n=12$). Regarding inappropriate compensatory behaviors to influence and/or control weight, patients reported vomiting ($n=4$), over-exercising ($n=2$), laxative abuse ($n=1$), diuretic abuse ($n=2$), and the use of diet pills ($n=1$), at a frequency of at least once a week in the previous 3 months. Two patients reported a history of the use of Ipecac® at admission. Additionally, one patient reported grazing behavior, and three patients reported engaging in chewing and spitting.

Table 1 presents data on the DSM-4 and DSM-5 criteria for the different eating disorders diagnostic categories at admission. For the current sample, most of the patients ($n=10$)

presented with AN symptoms. Based on the new DSM-5 proposed criteria for AN, six of these patients would have met criteria for an AN diagnosis and four met criteria for atypical AN, due to having a normal weight. Of the six patients meeting criteria for AN, two had purging AN subtype, three had restrictive AN subtype and one binge/purge AN type. Two patients were diagnosed with BN using DSM-5 criteria. One patient presented with a BMI of 23.8, which was considered to be a low BMI given that only a few patients achieve post-surgery a BMI below 25.^{26,27}

The core features of EDs, including excessive influence of body weight or shape on self-evaluation and over-evaluation of body weight and shape were present in all of the patients. Binge eating episodes were accompanied by marked distress in the binge eating patients.

Many patients also reported associated eating behaviors and cognitions that are often seen in patients with classic eating disorders. These included limiting food choices, calorie counting, cutting food into small pieces, experiencing persistent thoughts about foods and eating, preparing elaborate meals for others without the patient eating, secretive eating, following elaborate and restrictive food rules, disliking the feeling of having food in the stomach, watching cooking-related television shows, checking frequently one's weight and body size in old clothes; fearing eating, and comparing themselves with other women to decide on one's own level of thin appearance. Body dissatisfaction and negative body image were reported by the majority of patients and was often associated with dissatisfaction with hanging or redundant skin, a common problem post-bariatric surgery.

Four patients were readmitted several times to the clinical treatment center over the 4 years of this study due to reoccurrences of ED behaviors and/or the emergence of new eating disordered symptoms, such as binge eating after a restrictive eating initial diagnose, and the onset of vomiting, over-exercising, and use of diet pills. Interestingly two patients reported using dumping as a means of purging during subsequent admissions.

Prior Dieting and Eating Disorder Behavior

As would be expected, members of this group described an extensive dieting history, some dating back to childhood. Dieting histories before surgery included the use of over-the-counter diet pills (n=5), abuse of diuretics (n=4), abuse of laxatives (n=4), use of the phentermine-fenfluramine combination (n=1), and use phentermine alone (n=1).

A history of an ED or ED symptoms before surgery was reported by eight patients. Three patients had been diagnosed before surgery with an ED: two BN and one AN before surgery. Other commonly reported pre-surgery symptom were binge eating (n=5) and compensatory behaviors, including vomiting and the use of diuretics or laxatives (n=3). Three patients had migrated across different ED diagnostic categories over the years.

Family history and developmental risk factors for Eating Disorder

Most of the patients (n=10) reported a family history of psychiatric disorders, including depression and suicide, AN, and EDNOS, anxiety disorders, bipolar disorder, and alcohol or drug abuse/dependence.

Prior History and Co-Morbidities

The majority of patients reported a history of mood disorders (n=9), and four patients reported a history of an anxiety disorder before surgery. Pre-surgery hospitalization for suicide attempts (n=4) and for other psychiatric reasons (n=1) was also reported. At admission to the eating disorders center, mood disorders were diagnosed in nine patients, and six presented with anxiety disorders. Three patients reported a history of the occurrence

of self-mutilatory behaviors since surgery. Sleep disturbances were frequently reported, and seven patients were using sleep medication at the time of admission. Five patients reported using narcotics for intensive pain. Migraines were also commonly reported (n=5). Two patients presented with diabetes mellitus, and three patients had a history of a thyroid disorder. Three patients had been diagnosed with cannabis abuse before surgery. Two confirmed abusing cannabis at admission.

One patient reported narcotic dependence before bariatric surgery that had continued after surgery, and two patients reported illicit drugs use before surgery including methamphetamine and cocaine. One of these patients reported using these drugs for weight control. Nicotine dependence prior to surgery was also reported by two of the patients, and by three post-surgery. Past history of alcohol abuse before surgery was reported by two patients how was in remission at the time of admission, and alcohol dependence had emerged in two other patients.

Discussion

The prior literature indicated that there is a high frequency of sub-syndromal EDs in those with eating problems after surgery, as well as a lack of similarities across the available case reports.^{3,4} However, we were able to establish a DSM-5 diagnosis retrospectively for each of the reported cases, and only four cases had sub-syndromal presentations of AN. As opposed to non-bariatric surgery ED patients, where the most prevalent symptoms would be those seen in disorders that include binge eating (BN and BED),²⁸⁻³⁰ AN variants were the most common diagnosis in our sample, as would be true in many inpatient settings. Indeed, the majority of the women were quite successful in restricting their food intake, and only a few reported binge eating episodes. Interestingly, grazing and chewing/spitting were reported as alternatives to binge eating, and were referred by patients as strategies to overcome the physical restriction imposed by bariatric surgery, and to prevent plugging. Of note, of the seven patients reporting struggling with binge eating before surgery, only three reported binge eating at admission.

Research has shown that the prevalence of dumping, plugging and episodic vomiting are frequent among the post-bariatric patients,¹⁹ but in this context there is no evidence that these are ED symptoms. These eating problems usually occur in response to the ingestion of certain types of foods, eating too quickly or insufficient chewing. However some authors have suggested that these common gastrointestinal symptoms might facilitate the development of ED behaviors, and eventually trigger the onset of an ED in a subgroup of patients.³¹ We described that dumping was also reported as a compensatory behavior in two patients during subsequent admissions. Future research should explore further whether post-bariatric patients presenting with EDs actually develop new strategies to control their weight, and if bariatric surgery may facilitate ED symptoms, in particular AN-like symptoms, by promoting accentuated weight loss, restriction and purging behaviors, such as vomiting and dumping.

Another finding was that the cases showed several similarities with the classical EDs in eating behaviors and associated cognitions. Using the new proposed DSM-5 classification system, only four out of the twelve patients would be considered ED not elsewhere classified – atypical AN, in contrast to the 7 cases that would be diagnosed with an Eating Disorder Not Otherwise Specified using the former DSM-4 classification. We believe that the DSM-5 criteria proposal comprises a broader range for the significantly low BMI to be defined “in the context of age, sex, developmental trajectory, and physical health”, allows for a better characterization of the eating disorders seen in these patients.

Post-bariatric surgery recommendations for establishing the difference between normal and overweight individuals suggest that a BMI of 25 is considered as the division line between overweight and “normal” weight.³²⁻³⁵ However, this measure has been debated since only a few bariatric patients actually achieve and maintain their weight under a BMI of 25. In particular, for the super-obese, a BMI of 25 not only is difficult to achieve but may also be accompanied by evidence of malnutrition, despite such a BMI representing a “normal” weight.^{26,27} There is little agreement on what should be regarded as a “normal/ideal” BMI for patients losing large amounts of weight,²⁷ and, conversely, what should be considered an underweight BMI.

Despite the clear similarities among cases in the reported ED symptoms, the finding that most distinguished these patients from those with classical EDs was the age of the women identified, which was remarkably high in several patients. Despite this, some of these women reported a past history of an eating disorder before surgery. In all but four of them, the onset of the ED problem took place at an atypically older age. It remains unknown, however, if the surgery procedure triggered the reappearance of ED behaviors for those with an ED previous history.

It should be noted that some behaviors that resemble ED-type behaviors are taught and encouraged after bariatric surgery as a means to deal with the discomfort that may result when eating and facilitate the ingestion of the required/prescribed amounts of food. This makes it difficult to decide whether certain behaviors should be regarded as ED behaviors. Some patients will present with difficulties with plugging or dumping after bariatric surgery, which can result in involuntary vomiting or, in some cases, voluntary vomiting, that must be differentiated from purging for weight control purposes. Other patients may endorse in eating behaviors such as excessive chewing, cutting food into small pieces, eating small amounts of food repeatedly and avoiding certain foods, as part of a normal adjustment post-surgery.

This report includes some limitations that prevent generalization of the results. The similarities found across the different patients might be related to the fact that they were all seriously ill and requiring inpatient treatment. It is possible that sub-syndromal ED cases remain underreported, and it would be important to explore the distress associated with such cases. Another limitation is related to the method of data collection, which was based on clinical chart review and not on structured diagnostic interviews. Despite the fact that diagnostic criteria were employed, the actual amount of food during eating episodes and the time elapsed during the binge eating episode does not allow us to distinguish between objective (OBE) and subjective binge eating (SBE). Some authors have argued that the occurrence of OBEs may be impossible or rare after surgery;^{8,11,12} however the descriptions provided in the notes of the BN case supported that the amount of calories ingested during an objective binge eating episode was indeed large (suggesting 4000-5000 kcal/day).

Conclusions

As the number of patients who undergo bariatric surgery continues to increase, it is important for clinicians to be alert of the range of complications that can be develop. EDs have not been widely recognized in bariatric surgery patients, but a number of patients seem to present with symptoms that merit ED diagnoses and require specialized treatment.

The treatment of eating disorders in these patients may have to be modified for a number of reasons. First, these patients have specialized nutritional needs because of alterations in their gastrointestinal system. In addition, patients may endorse in ED-like behaviors such as

excessive chewing, cutting food into small pieces, eating small amounts of food repeatedly and avoiding certain foods as part of a normal adjustment post-surgery.

Future research is required in order to study the prevalence of the different ED diagnoses and ED syndromes, and to identify predictors for the emergence of these conditions.

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References

1. Buchwald H. 2004 ASMBS Consensus Conference: Consensus statement Bariatric surgery for morbid obesity: Health implications for patients, health professionals, and third party payers. *Surg Obes Relat Dis.* 2005; 1:371–381. [PubMed: 16925250]
2. van Hout G. Psychosocial Effects of Bariatric Surgery. *Acta Chir Belg.* 2005; 105:40–43. [PubMed: 15790201]
3. Marino JM, Ertelt TW, Lancaster K, Steffen K, Peterson L, de Zwaan M, et al. The Emergence of Eating Pathology after Bariatric Surgery: A Rare Outcome with Important Clinical Implications. *Int J Eat Disord.* 2012; 45:179–184. [PubMed: 21495051]
4. Segal A, Kusunoki DK, Larino MA. Post-Surgical Refusal to Eat: Anorexia Nervosa, Bulimia Nervosa or a New Eating Disorder? A Case Series. *Obes Surg.* 2004; 14:353–360. [PubMed: 15072657]
5. Atchison M, Wade T, Higgins B, Slavotinek T. Anorexia Nervosa Following Gastric Reduction Surgery for Morbid Obesity. *Int J Eat Disord.* 1998; 23:111–116. [PubMed: 9429928]
6. Stunkard AJ, Allison KC. Two forms of disordered eating in obesity: binge eating and night eating. *Int J Obes.* 2003; 27:1–12.
7. Colles SL, Dixon JB, O'Brien PE. Grazing and Loss of Control Related to Eating: Two High-risk Factors Following Bariatric Surgery. *Obesity.* 2008; 16:615–622. [PubMed: 18239603]
8. Saunders R. Compulsive Eating and Gastric Bypass Surgery: What does Hunger have to do with It? *Obes Surg.* 2001; 11:757–761. [PubMed: 11775577]
9. van Hout GCM, Hagendoren CAJM, Verschure SKM, vanHeck GL. Psychosocial Predictors of Success After Vertical Banded Gastroplasty. *Obes Surg.* 2009; 19:701–707. [PubMed: 18317854]
10. van Hout GCM, Verschure SKM, van Heck GL. Psychosocial Predictors of Success Following Bariatric Surgery. *Obes Surg.* 2005; 15:552–560. [PubMed: 15946437]
11. White MA, Kalarchian MA, Masheb RM, Marcus MD, Grilo CM. Loss of Control Over Eating Predicts Outcomes in Bariatric Surgery Patients: A Prospective, 24-Month Follow-Up Study. *J Clin Psychiatry.* 2010; 71:175–184. [PubMed: 19852902]
12. Saunders R. "Grazing": A High-Risk Behavior. *Obes Surg.* 2004; 14:98–102. [PubMed: 14980042]
13. Adami GF, Gandolfo P, Bauer B, Scopinaro N. Binge eating in massively obese patients undergoing bariatric surgery. *Int J Eat Disord.* 1995; 17:45–50. [PubMed: 7894452]
14. Allison KC, Wadden TA, Sarwer DB, Fabricatore AN, Crerand CE, Gibbons LM, et al. Night Eating Syndrome and Binge Eating Disorder among Persons Seeking Bariatric Surgery: Prevalence and Related Features. *Obesity.* 2006; 14:811–820.
15. Adami G, Meneghelli A, Nicola S. Night eating and Binge eating disorder in obese patients. *Int J Eat Disord.* 1999; 25:335–338. [PubMed: 10191999]
16. Hsu LKG, Betancourt S, Sullivan SP. Eating Disturbances Before and After Vertical Banded Gastroplasty: A Pilot Study. *Int J Eat Disord.* 1996; 19:23–34. [PubMed: 8640199]
17. Gluck M, Geliebter A, Satov T. Night eating syndrome is associated with depression, low self esteem, reduced daytime hunger, and less weight loss in obese outpatients. *Obes Res.* 2001; 9:264–267. [PubMed: 11331430]

18. Rand C, Macgregor M, Stunkard A. The night eating syndrome in the general population and post-operative obesity surgery patients. *Int J Eat Disord.* 1997; 22:65–69. [PubMed: 9140737]
19. de Zwaan M, Hilbert A, Swan-Kremeier L, Simonich H, Lancaster K, Howell LM, et al. Comprehensive interview assessment of eating behavior 18–35 months after gastric bypass surgery for morbid obesity. *Surg Obes Relat Dis.* 2010; 6:79–85. [PubMed: 19837012]
20. Burgmer R, Grigutsch K, Zipfel S, Wolf AM, de Zwaan M, Husemann B, et al. The Influence of Eating Behavior and Eating Pathology on Weight Loss after Gastric Restriction Operations. *Obes Surg.* 2005; 15:684–691. [PubMed: 15946461]
21. Saunders R. Binge Eating in Gastric Bypass Patients Before Surgery. *Obes Surg.* 1999; 9:72–76. [PubMed: 10065590]
22. Sarwer DB, Wadden TA, Fabricatore AN. Psychosocial and Behavioral Aspects of Bariatric Surgery. *Obes Res.* 2005; 13:639–648. [PubMed: 15897471]
23. Kriwanek S, Blauensteiner W, Lebisch E. Dietary changes after vertical banded gastroplasty. *Obes Surg.* 2000; 10:37–40. [PubMed: 10715642]
24. Pessina A, Andreoli M, Vassallo C. Adaptability and Compliance of the Obese Patient to Restrictive Gastric Surgery in the Short Term. *Obes Surg.* 2001; 11:459–463. [PubMed: 11501355]
25. American Psychiatric Association. DSM-5 Proposed Diagnostic Criteria for Anorexia Nervosa. American Psychiatric Association; Available at <http://www.dsm5.org/ProposedRevision/Pages/proposedrevision.aspx?rid=24>
26. Baltasar A, Pérez N, Serra C, Bou R, Bengochea M, Borrás F. Weight Loss Reporting: Predicted Body Mass Index After Bariatric Surgery. *Obes Surg.* 2011; 21:367–372. [PubMed: 20683784]
27. Dixon JB, McPhail T, O'Brien PE. Minimal Reporting Requirements for Weight Loss: Current Methods Not Ideal. *Obes Surg.* 2005; 15:1034–1039. [PubMed: 16105403]
28. Machado PPP, Machado BC, Gonçalves S, Hoek HW. The Prevalence of Eating Disorders Not Otherwise Specified. *Int J Eat Disord.* 2007; 40:212–217. [PubMed: 17173324]
29. Hoek HW. The incidence and prevalence of anorexia nervosa and bulimia nervosa in primary care. *Psych Med.* 1991; 21:455–460.
30. Hoek HW, van Hoeken D. Review of the prevalence and incidence of eating disorders. *Int J Eat Disord.* 2003; 34:383–396. [PubMed: 14566926]
31. Guisando JA, Vaz FJ, López-Ibor JJ, López-Ibor MI, del Río J, Rubio MA. Gastric surgery and restraint from food as triggering factors of eating disorders in morbid obesity. *Int J Eat Disord.* 2002; 31:97–100. [PubMed: 11835303]
32. Deitel M, Gawdat K, Melissas J. Reporting weight loss. *Obes Surg.* 2007; 17:565–568. [PubMed: 17658011]
33. Deitel M, Greenstein RJ. Editorial: Recommendations for Reporting Weight Loss. *Obes Surg.* 2003; 13:159–160. [PubMed: 12760387]
34. Greenstein R. Reporting weight loss. *Obes Surg.* 2007:1275–1276. [PubMed: 18074507]
35. SOARD. Guidelines for weight calculations and follow-up in bariatric surgery. *Surg Obes Relat Dis.* 2005; 1:67–68. [PubMed: 16925214]

Table 1

Eating Disorder DSM criteria for each patient.

Participant #	Age	BMI (pre)	BMI (adm)	Caloric restriction	Fear weight gain	Weight/shape influence	Binge	Compensatory behaviors	Post-bariatric behaviors	DSM-4	DSM-5
1	65	58.6	23.8	✓	✓	✓	–	Vomiting	–	EDNOS	AN-P
2	52	79.3	33.9	✓	✓	✓	–	Over-exercise	–	EDNOS	EDNEC (Atypical AN-R)
3	31	48.7	29.6	✓	✓	✓	–	Over-exercise	–	EDNOS	EDNEC (Atypical AN-R)
4	52	42.4	17.4	✓	✓	✓	–	–	Vomiting; Plugging	AN-R	AN-R
5	64	47.4	21.2	✓	✓	✓	–	–	Grazing; Vomiting	EDNOS	EDNEC (Atypical AN-R)
6	23	66.2	39.6	–	–	✓	✓	Vomiting	–	BN	BN
7	69	43.1	28.8	✓	✓	✓	–	–	–	EDNOS	EDNEC (Atypical AN-R)
8	29	43.6	27.9	–	–	✓	✓	Vomiting, Laxative, Diuretics	Chew & Spit; Grazing; Dumping; Plugging	BN	BN
9	61	40.6	21.1	✓	✓	✓	–	Diuretics	Chew & Spit; Vomiting; Dumping	EDNOS	AN-P
10	52	47.4	13.1	✓	✓	✓	✓	Vomiting	Chew & Spit	AN-B/P	AN-B/P
11	26	44.8	17.3	✓	✓	✓	–	Diet Pills	–	AN-R	AN-R
12	38	45.2	19.8	✓	✓	✓	–	–	Vomiting; Plugging	EDNOS	AN-R

✓ - Symptom present; **BMI (pre)** - BMI pre-surgery; **BMI (adm)** - BMI at admission to hospital; **EDNOS** - Eating Disorders Not Otherwise Specified (DSM-IV); **EDNEC** - Eating Disorders Not Elsewhere Classified (DSM-5); **AN-B/P** - Anorexia Nervosa Binge/Purging type; **AN-R** - Anorexia Nervosa Restrictive type; **BN** - Bulimia Nervosa; **BED** - Binge Eating Disorder