

# Preoperative evaluation of the morbidly obese patients for bariatric surgery

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**Contributions:** (I) Conception and design: TT Sahin; (II) Administrative support: K Kutluturk; (III) Provision of study materials or patients: None; (IV) Collection and assembly of data: None; (V) Data analysis and interpretation: None; (VI) Manuscript writing: Both authors; (VII) Final approval of manuscript: Both authors.

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**Abstract:** Bariatric surgery is the gold standard treatment for morbid obesity with only means of long terms weight control. However, it is a major upper gastrointestinal system surgery. The patients have co-morbidities that poses a significant perioperative risk. Thorough cardiac, pulmonary, upper gastrointestinal and psychiatric evaluation is mandatory. Any upper gastrointestinal premalignant lesion must be ruled out before any upper gastrointestinal intervention that could prevent a regular surveillance. However, majority of the postoperative serious complications are related with complications such as pulmonary embolism, postoperative hypoventilation, and myocardial infarction that can lead to mortality. Therefore, necessary precautions; such as low molecular weight heparin, external compression stockings and non-invasive mechanical ventilatory support; should be taken by the physician. Psychiatric consultations and support groups are very important for majority of the patients have psychosocial problems that cause cognitive problems in the patients that can change the compliance of the patients towards postoperative behavioral change. Furthermore, any substance abuse must be ruled out in these patient group. Team work is the only means of success when treating patients with morbid obesity. A team that consists of bariatric surgeon, nurse, dietician, endocrinologist, psychiatrist and behavioral psychologist is mandatory for a thorough evaluation of the patient and also for postoperative follow up.

**Keywords:** Morbid obesity; bariatric surgery; metabolic surgery; preoperative evaluation

Received: 29 February 2020; Accepted: 30 September 2020; Published: 20 October 2021.

doi: 10.21037/ales-20-49

**View this article at:** <http://dx.doi.org/10.21037/ales-20-49>

## Introduction

According to the definition of World Health Organization obesity is defined as surplus of energy intake when compared to the expenditure of the individual (1). Therefore, there is a non-physiological deposition of the fat in the individual (1). This causes a co-morbid condition such as diabetes, hypertension, cardiovascular disease and reduces the life expectancy of the individual (2). Obesity is a global health problem threatening the individuals around the world. Its estimated incidence in adults is more than 30% and it is around 20% in the children and adolescents (3). In Turkey, more than 30% of the adult population is either

over-weight or obese which shows an age-related increase in both sexes (4).

In definition, bariatric and metabolic surgery is defined as the manipulations made in the gastrointestinal tract to reverse the metabolic and weight changes caused by obesity (5). It is the only definitive curative option in patients with morbid obesity. In the advanced laparoscopic era where robot assisted minimal invasive surgery is being discussed bariatric and metabolic surgery is being increasingly employed.

However, it is major gastrointestinal operation that requires a thorough planning and patient preparation.

Therefore, physicians dealing with such a patient should have a thorough and modular work up plan for assessment of risk and benefits of the patients. Therefore, the aim of the review is to evaluate the steps of patient evaluation for bariatric surgery.

### Indications and Patient selection for Bariatric Surgery

The 1991 National Institutes of Health (NIH) Consensus Development Conference Statement on Gastrointestinal Surgery for Severe Obesity; although more than 20 years old; forms the foundations of the indications for bariatric and metabolic surgery (6). According to this statement the indications for surgery for morbid obesity are: (I) Patients whose body mass index (BMI) exceeds  $40 \text{ kg/m}^2$ ; (II) patients with BMIs between 35 to  $40 \text{ kg/m}^2$  with comorbid conditions or lifestyle—limiting obesity-induced physical conditions. These are valid provided that the patient is fully informed of the risks and benefits and also has tried non-surgical treatments such as life style changes and regular exercise and has failed to reduce weight or obtain a sustained weight loss (6).

The vague point of the criteria that is problematic is the co-morbid conditions that are being observed in obesity. This will also form the foundations of the preoperative patient evaluation for a bariatric and metabolic surgery. These co-morbid conditions limit the life expectancy of the patient and also increase the perioperative morbidity and mortality of the individual.

The life threatening co-morbid conditions related with obesity are obesity related sleep apnea, obesity related hypoventilation syndrome, obesity related cardiomyopathy and diabetes (7). The physical conditions associated with obesity are physical conditions interfering with employment, social and family function and even ambulation of the individual (8). Furthermore, hypertension, hyperlipidemia, nonalcoholic fatty liver disease, gastro- esophageal reflux, pseudotumor cerebri, asthma, venous stasis disease, and urinary incontinence are all health problems associated with obesity (9).

If there is an absolute contraindication to general anesthesia, patients who are pregnant or anticipate pregnancy in the following 12 months. Limited intellectual capacity limiting the individual from taking necessary measures to change the life style following surgery is a contraindication for bariatric and metabolic surgery (10). Although there are contradicting reports, Prader-Willi

syndrome; a genetic disease causing hyperphagia is an absolute contraindication for surgery (10,11). Sustained substance abuse by the individual precludes the benefits of surgery and therefore bariatric surgery should not be employed in addicts of any kind (either alcohol or other drugs) (8,10).

The age limit to which bariatric surgery can be performed is controversial, however generally upper age limit for bariatric surgery is 65 years (6). However, there is growing evidence to support that physiologic condition of the patient is important and that bariatric surgery can be performed safely in the elderly. Generally non-ambulatory patients should not be operated (12).

Stable psychiatric disorders such as stable schizophrenia, psychosis and ay eating disorders is not a contraindication for surgery. However, bariatric surgery should not be performed in patients with active psychiatric disease (13,14).

In morbid obesity, the incidence of non-alcoholic fatty liver disease is roughly 50%. Therefore, liver disease is not a contraindication for bariatric surgery (15). On the other hand, bariatric surgery; especially sleeve gastrectomy; can be employed in patients with cirrhosis before liver transplantation in order to provide better outcomes. However, in cases with cirrhosis and findings of portal hypertension, bariatric surgery is contraindicated and should not be performed in order to avoid any complications (16).

The metabolic and bariatric surgery can be performed safely and is effective in patients with well-controlled HIV infection that is demonstrated by a stable response to antiretroviral therapy as determined by CD4 counts (17,18).

### Preoperative patient care and evaluation

In the guidance of what we have discussed in the indications section, thorough evaluation of the patient including the informed consent should be obtained during the preparation phase for the bariatric surgery. Therefore, the following sections will provide a summary for evaluation of the organ systems including Cardiovascular, respiratory systems, assessment of risk of venous thromboembolism, evaluation of the anatomy of the upper gastrointestinal system, psychiatric evaluation of the patients that are candidates for bariatric surgery.

#### *Evaluation of the cardiovascular system*

Diabetes, hypertension, dyslipidemia and obstructive sleep apnea observed in morbid obesity is a significant risk factor

for cardiovascular disease in the obese individuals (19). Therefore, myocardial infarction, cardiac failure and sudden cardiac death risk is increased in obese individuals. Furthermore, total cardiac output and cardiac workload by increasing sympathetic tone and heart rate as well as filling pressures are seen in morbidly obese individuals (19,20). In addition to all, increased BMI is correlated with increased incidence of cardiovascular problems seen in obese individuals (20).

All these factors result in an increased tendency for cardiovascular events during the perioperative period. Therefore, a detailed cardiac evaluation is indicated in obese individuals that are candidates for bariatric surgery. A detailed medical history including hypertension, diabetes, hyperlipidemia, family history of cardiovascular disease is necessary. Furthermore, electrocardiogram should be obtained to detect any Q-T abnormalities and cardiac arrhythmias. (21,22). Any problems detected during this evaluation or presence of ischemic myocardial disease, cerebrovascular disease or renal insufficiency during the evaluation process requires that patient should be evaluated with stress test and coronary angiography before any surgical plan (22).

#### *Evaluation of the respiratory system*

The two most important problems that poses a risk for the obese individuals are the obstructive sleep apnea syndrome (OSAS) and the obesity related malignant hypoventilation syndrome (ORMHS). The incidence of OSAS may be as high as 8% among the individuals with morbid obesity (23). Untreated OSA result in hypoxemia during sleep, and cause pulmonary hypertension, that is a risk factor for cardiac arrhythmias. Bariatric surgery patients are at particular risk when the effect of anesthetics or narcotic medication may blunt the protective arousal of hypoxic patients resulting in profound hypoxia or respiratory arrest (24). A study by our group has shown that it has a BMI in morbid obesity impact on respiratory dynamics during surgery (25).

Determination of the vital capacity is very important in individuals in the preoperative period. It helps to determine development of certain complications in the postoperative period (26). Therefore any patients that is candidate for bariatric surgery should undergo polysomnographic evaluation and respiratory function test to evaluate the extent of pulmonary involvement (27).

Obesity causes reduced the chest wall and pulmonary compliance. This results in reduction in gas exchange increased bronchial resistance and ventilation perfusion

mismatch. Patients seeking bariatric surgery also commonly suffer from asthma, dyspnea, and chronic pulmonary obstructive disease (COPD). In the extreme spectrum of the pulmonary diseases observed in these individuals, partial carbon dioxide pressures increase over 45 mmHg and the saturation of the individual is reduced below 94% without extra oxygen supplementation. This defined as ORMHS and these individuals are more prone to prolonged intubation, tracheostomy and death due to pulmonary disease in the perioperative period (23,24). Preoperative respiratory assist devices can be used in these patients as a preparation to surgery.

#### *Assessment of the risk of venous thromboembolism*

The two most important complications that lead to mortality following bariatric surgery is gastrointestinal system leaks and pulmonary embolism. Therefore, suitable prophylaxis with low molecular heparin should be done for the patients in the perioperative period. The incidence of venous thromboembolism is nearly 0.5% in the morbidly obese population and pulmonary embolism is responsible for the 50% of the deaths observed in these patients in the postoperative period (28).

The risk factors for venous thromboembolism are male gender, higher BMI, predicted operative time more than three hours, older age, and complex gastrointestinal procedures such as biliopancreatic diversion with duodenal switch (BPD-DS) and development of perioperative complications such as leaks (28,29). Placement of vena cava filters in the high risk individuals have not been found beneficial or superior to prophylaxis (30).

#### *Evaluation of the upper gastrointestinal system*

Roughly 10% of the patients scheduled for surgery for obesity have abnormal findings in upper gastrointestinal endoscopy (31). Eradication of *Helicobacter pylori* before any bariatric surgery has paramount importance. This is especially important in mixed restrictive and malabsorptive procedures such as mini-gastric and Roux en Y gastric bypass. This due to the fact that there is a remnant gastric pouch that is inaccessible after surgery. Patients with family history of malignant gastrointestinal system neoplasm should undergo routine preoperative evaluation before any procedure. Furthermore findings such as hiatal hernia can alter the technique of surgery that will be applied to the patient. Therefore, routine upper gastrointestinal system

endoscopy has paramount importance in patients with morbid obesity that are scheduled for surgery (31,32).

### Psychiatric evaluation

Psychiatrists and behavioral psychologists should evaluate the patients thoroughly. There two major points to be answered. First one is there a disturbance in the eating behavior of the patient. Because if the answer to this question is yes; then the a malabsorptive procedure should be planned for the patient. Secondly, is there an active psychiatric disorder which is an absolute contraindication for the patients scheduled for surgery (33,34). Furthermore, expectations of the patients from surgery is very important to avoids future problems that may occur (33). Therefore, behavioral assessment of the patients before surgery should be complete and any means including interviews, support groups and visits by the prior patients should be employed.

### Conclusions

Management of the morbidly obese patients is a team work. It should be orchestrated by the bariatric surgeon. It should include dietician, bariatric nurse endocrine specialist gastroenterologist, behavioral psychologists and psychiatrists dedicated to the task. Establishing such a team is the key to success. Only after evaluation by the team and obtaining an informed consent, physician should continue to the surgery. Only as a team, future problems and successes can be shared and handled.

### Acknowledgments

*Funding:* None.

### Footnote

*Provenance and Peer Review:* This article was commissioned by the Guest Editor (Mehmet Mahir Ozmen) for the series “Bariatric and Metabolic Surgery” published in *Annals of Laparoscopic and Endoscopic Surgery*. The article has undergone external peer review.

*Conflicts of Interest:* Both authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/ales-20-49>). The series “Bariatric and Metabolic Surgery” was commissioned by the editorial office without any funding or sponsorship. The authors

have no other conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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### References

1. Ogden CL, Carroll MD, Kit BK, et al. Prevalence of obesity in the United States, 2009-2010. NCHS Data Brief 2012;(82):1-8.
2. Raza Q, Doak CM, Khan A, et al. Obesity and cardiovascular disease risk factors among the indigenous and immigrant Pakistani population: a systematic review. *Obes Facts* 2013;6:523-35.
3. Rimm A. Prevalence of obesity in the United States. *JAMA* 2014;312:189.
4. Erem C. Prevalence of Overweight and Obesity in Turkey. *IJC Metab Endocr* 2015;8:38-41.
5. Pories WJ, Swanson MS, MacDonald KG, et al. Who would have thought it? An operation proves to be the most effective therapy for adult-onset diabetes mellitus. *Ann Surg* 1995;222:339-50.
6. NIH conference. Gastrointestinal surgery for severe obesity. Consensus Development Conference Panel. *Ann Intern Med* 1991;115:956-61.
7. Mechanick JI, Youdim A, Jones DB, et al. Clinical practice guidelines for the perioperative nutritional, metabolic, and nonsurgical support of the bariatric surgery patient - 2013 update: Cosponsored by American Association of Clinical Endocrinologists, the Obesity Society, and American Society for Metabolic & Bariatric Surgery, Surgery for Obesity and Related Diseases. *Surg Obes Relat Dis* 2013;9:159-91.
8. Buchwald H, Owen H, Wangensteen SD, et al. Consensus Conference Statement. Bariatric surgery for morbid obesity: Health implications for patients, health professionals, and third-party payers. *Surg Obes Relat Dis*

- 2005;1:371-81.
9. Dixon JB, Zimmet P, Alberti KG, et al. Bariatric surgery: An IDF statement for obese Type 2 diabetes. *Surg Obes Relat Dis* 2011;7:433-47.
  10. Collazo-Clavell ML, Clark MM, McAlpine DE, et al. Assessment and preparation of patients for bariatric surgery. *Mayo Clin Proc* 2006;81:S11-7.
  11. Alqahtani AR, Elahmedi MO, Al Qahtani AR, et al. Laparoscopic sleeve gastrectomy in children and adolescents with Prader-Willi syndrome: A matched-control study. *Surg Obes Relat Dis* 2016;12:100-10.
  12. Dorman RB, Abraham AA, Al-Refaie WB, et al. Bariatric Surgery Outcomes in the Elderly: An ACS NSQIP Study. *J Gastrointest Surg* 2012;16:35-44.
  13. Peterhänsel C, Wagner B, Dietrich A, et al. Obesity and co-morbid psychiatric disorders as contraindications for bariatric surgery? - A case study. *Int J Surg Case Rep* 2014;5:1268-70.
  14. Pull CB. Current psychological assessment practices in obesity surgery programs: what to assess and why. *Curr Opin Psychiatry* 2010;23:30-6.
  15. Marceau P, Biron S, Hould FS, et al. Liver pathology and the metabolic syndrome X in severe obesity. *J Clin Endocrinol Metab* 1999;84:1513-7.
  16. Shimizu H, Phuong V, Maia M, et al. Bariatric surgery in patients with liver cirrhosis. *Surg Obes Relat Dis* 2013;9:1-6.
  17. Selke H, Norris S, Osterholzer D, et al. Bariatric surgery outcomes in HIV-infected subjects: A case series. *AIDS Patient Care STDS* 2010;24:545-50.
  18. Flancbaum L, Drake V, Colarusso T, et al. Initial experience with bariatric surgery in asymptomatic human immunodeficiency virus-infected patients. *Surg Obes Relat Dis* 2005;1:73-6.
  19. Lavie CJ, Milani RV, Ventura HO. Obesity and cardiovascular disease: risk factor, paradox, and impact of weight loss. *J Am Coll Cardiol* 2009;53:1925-32.
  20. Litwin SE. Which measures of obesity best predict cardiovascular risk?. *J Am Coll Cardiol* 2008;52:616-9.
  21. Schlottmann F, Nayyar A, Herbella FAM, et al. Preoperative Evaluation in Bariatric Surgery. *J Laparoendosc Adv Surg Tech A* 2018;28:925-9.
  22. Gondal AB, Hsu CH, Khoubyari R, et al. Development of a bariatric surgery specific risk assessment tool for perioperative myocardial infarction. *Surg Obes Relat Dis* 2019;15:462-8.
  23. Piper AJ, Grunstein RR. Obesity hypoventilation syndrome: mechanisms and management. *Am J Respir Crit Care Med* 2011;183:292-8.
  24. Gasal M, Salord N, Fortuna AM, et al. Optimizing screening of severe obstructive sleep apnea in patients undergoing bariatric surgery. *Surg Obes Relat Dis* 2013;9:539-46.
  25. Ayyildiz A, Pamuk GA, Uzumcugil F, et al. The Effects of BMI on Respiratory and Hemodynamic Parameters in Laparoscopic Bariatric Surgery: An Observational Study. *Bariatric Surg Pract Patient Care* 2019;14:34-40.
  26. Yokota S, Koizumi M, Togashi K, et al. Preoperative pulmonary function tests do not predict the development of pulmonary complications after elective major abdominal surgery: A prospective cohort study. *Int J Surg* 2020;73:65-71.
  27. Di Corpo M, Schlottmann F, Patti MG. Bariatric Surgery: Clinical Presentation and Evaluation. In: *Foregut Surgery*. Springer International Publishing, 2020:237-48.
  28. Finks JF, English WJ, Carlin AM, et al. Predicting risk for venous thromboembolism with bariatric surgery: Results from the Michigan bariatric surgery collaborative. *Ann Surg* 2012;255:1100-4.
  29. Helm MC, Simon K, Higgins R, et al. Perioperative complications increase the risk of venous thromboembolism following bariatric surgery. *Am J Surg* 2017;214:1135-40.
  30. Birkmeyer NJO, Share D, Baser O, et al. Preoperative placement of inferior vena cava filters and outcomes after gastric bypass surgery. *Ann Surg* 2010;252:313-8.
  31. Korenkov M, Sauerland S, Shah S, et al. Is routine preoperative upper endoscopy in gastric banding patients really necessary? *Obes Surg* 2006;16:45-7.
  32. Abou Hussein B, Khammas A, Shokr M, et al. Role of routine upper endoscopy before bariatric surgery in the Middle East population: a review of 1278 patients. *Endosc Int Open* 2018;6:E1171-6.
  33. Walfish S, Vance D, Fabricatore AN. Psychological evaluation of bariatric surgery applicants: Procedures and reasons for delay or denial of surgery. *Obes Surg* 2007;17:1578-83.
  34. Fabricatore AN, Crerand CE, Wadden TA, et al. How do mental health professionals evaluate candidates for bariatric surgery? Survey results. *Obes Surg* 2006;16:567-73.

doi: 10.21037/ales-20-49

**Cite this article as:** Sahin TT, Kutluturk K. Preoperative evaluation of the morbidly obese patients for bariatric surgery. *Ann Laparosc Endosc Surg* 2021;6:49.