

# Preoperative evaluation of the morbidly obese patients for bariatric surgery

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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 comorbidities 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

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## 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 kg/m<sup>2</sup>; (II) patients with BMIs between 35 to 40 kg/m<sup>2</sup> 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.

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