

Obesity and Bariatric Surgery



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Introduction to Obesity

Obesity is a chronic disease that can have profound effects on a person's body as well as mind. Simple everyday tasks can become challenging for an obese person who must also deal with social, psychological and health problems. In its severe form, obesity can lead to serious health problems, poor quality of life and a shortened life span. Obesity is a chronic disease that is difficult to fight alone. The vast majority (95%) of patients will have struggled with multiple diets only to find the weight has come back on.

Calculating Body Mass Index (BMI)

Obesity is defined as the presence of fat in excessive amounts in the body. Using weight is not accurate in assessing obesity as it doesn't take into account each patient's body form. A relatively easy way to classify the severity of obesity is to use the body mass index (BMI) which is calculated as weight (kgs) divided by height square (m²). A normal BMI is between 19 and 25kg/m². A person with a BMI between 25 and 30 is considered overweight. A patient with a BMI more than 30kg/m² is considered obese and one with a BMI in excess of 35kg/m² is considered morbidly obese. Bariatric surgery is generally considered in patients with a BMI more than 35kg/m². To calculate your BMI use the formula below.

$$\text{BMI} = \text{Weight (kg)} / \text{Height}^2 \text{ (m}^2\text{)}$$

Health Risks Associated with Obesity

Obesity is a dangerous disease that leads to a shortened lifespan and poorer quality of life.

Surgery is Very Effective

Weight loss surgery (WLS) or bariatric surgery is the most effective treatment of morbid obesity. It has been shown over many decades to improve health, enhance quality of life and prolong survival. WLS carries some risks and side effects. Therefore there should be a balance between risk and benefit from surgery and patients should be selected carefully for WLS.

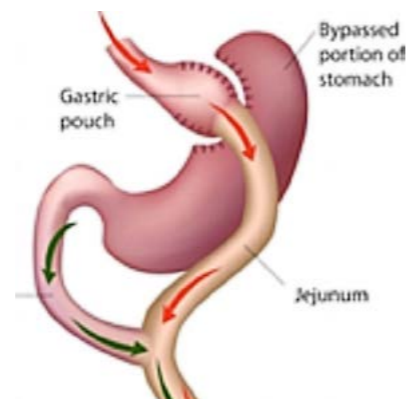
Who is a Good Candidate for WLS?

A good candidate for WLS is someone who has morbid obesity BMI >35 kg/m² especially if he or she has obesity related medical problems such as diabetes or sleep apnea, has tried multiple diet programs but failed, is motivated to modify lifestyle and dietary habits after WLS, is mentally and psychologically stable, and understands the risks and benefits of WLS.

WLS can be considered at any age but the very young and the very old need more extensive evaluation and counseling. WLS may be considered for patients who are less severely obese if they suffer from obesity related complications and are not responding to conventional treatment.

Some Examples of WLS:

Laparoscopic Roux-y-gastric bypass (LRYGB)



The Roux-y-gastric bypass (RYGB) is one of the oldest operations performed for the treatment of morbid obesity. It started in the United States in the late 1960s after surgeons observed weight loss

following operations done for peptic ulcer disease.. It is done laparoscopically using small "key hole" incisions in most cases.

The steps of the operation include:

1. Dividing the stomach into 2 parts: A small "pouch" measuring around 30ml and the rest of the stomach that will no longer be in contact with food. The division is accomplished by staplers (see link to staplers)
2. The next step is to divide the small intestine again with staplers and bring the intestine to the pouch and create a connection between the pouch and the small intestine (anastomosis). The intestine carrying the juices from the stomach, liver (bile) and pancreas is connected to the intestine about 100 to 150 cm away from the pouch (see diagram). This way all the digestive juices mix with the ingested food and absorption of calories should be normal.

Results

Weight loss starts immediately after the operation and continues up to 12 to 18-months after surgery. At this time the average weight loss is around a third of the original weight. After the second year most patients regain a little bit of weight so the weight loss averages at around 25% of the original weight.

More importantly, gastric bypass has been shown to be the most effective treatment for diabetes and many obesity related health problems such as high blood pressure and sleep apnea. Most patients feel better and healthier. In fact several studies have demonstrated that patients who undergo gastric bypass live longer and develop less cancer than other obese patients who don't receive bariatric surgery.

Risks and Side Effects

Immediate serious risks following RYGB occur in 5% of patients and include the risk of deep vein thrombosis (blood clots), pulmonary embolus, leak and deep abdominal infection, bleeding and intestinal blockage. Most will appear within the first few days. Some of these complications are best managed with early re-operation. The risk of death is less than 0.3% in experienced bariatric surgical centers such as ours.

Long term side effects include temporary hair loss, occasional fatigue, anemia, vitamin deficiency, gallstones and loose skin. That is why it is important to maintain regular follow-up and perform blood tests at least twice

a year.

Dumping syndrome is a known side effect of the gastric bypass and consists of a set of symptoms that appear after eating high caloric food. These symptoms include fatigue, dizziness, near fainting, fast heartbeat, cold sweats and are related to low blood sugar in the blood. It is paradoxical but eating sugary foods will stimulate the pancreas to release large amounts of insulin which in turn lower the blood sugar. Dumping syndrome is preventable by avoiding high calorie foods and relying more on vegetables and proteins.

Life after the Lap RYGB

The average operation takes about 90 minutes and the average stay in the hospital is around 2 days. The phases of diet include clear fluids for three days, thick fluids for five days and soft food for one week. Thereafter food intake becomes normal. Most patients return to work within 10 days of the operation and resume exercise three weeks later.

Long-term commitment to healthy eating habits and regular activity are important to guarantee the success of the operation.

Laparoscopic Adjustable Gastric Band (LAGB)

Adjustable Gastric Band (Lap Band)



The Laparoscopic Adjustable Gastric Band (LAGB) was the first bariatric operation performed with small incisions. It was described in the early 1990's and quickly became the most widely performed bariatric operation in Europe and the Middle

East. Enthusiasm for the band has gradually waned because of disappointing long-term results. The gastric band is made of silicon and is wrapped around the upper part of the stomach to restrict the passage of food from the esophagus down into the stomach. On the inside of the band there is a balloon that can be inflated to tighten the opening further and deflated to loosen it up. The adjustments are done by injecting a needle into a reservoir that is implanted under the skin. The reservoir and the band are connected via a long tube.

Results

There are distinct advantages to the band including its simplicity as an operation, low immediate risks and the fact that it is adjustable. Unlike the gastric bypass and sleeve it may not necessarily decrease hunger or the Ghrelin hormone levels that stimulate appetite so in a way the struggle with fighting hunger persists. That is why results depend more on the patient's commitment to dietary and lifestyle changes. Results vary a lot depending on how close and intense the follow-up is. Some patients achieve excellent results on follow-up of more than 10 years. However at least 50% of patients have poor weight loss or have to remove the band for reasons such as band malfunction, slippage and erosion.

Risks and Side Effects

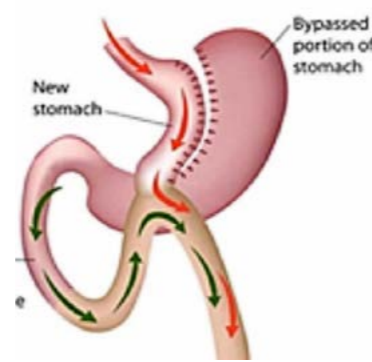
Immediate risks following gastric band placement are uncommon but can include DVT, PE, injury to the stomach and esophagus. The risk of mortality related to the operation is very low (less than 1 per 1000). Long-term problems though are common and present in more than 50% of patients. Most require band replacement, removal with alternated bariatric operation. Examples include acid reflux, dilation of the esophagus, band slippage, and band erosion inside the stomach, cracks in the band, tubing or reservoir.

Life after the LAGB

The average operation takes about 60 minutes and the average stay in the hospital is around 1 day. Many patients go home the same day. Most patients return to work within 10 days of the operation and resume exercise three weeks later.

The phases of diet include fluids for three weeks. At week #4 we start adjusting the band and further tightening is done in clinic with follow-up depending on weight loss and food tolerability. Some adjustments will need X-ray guidance. Food intake after the band becomes more difficult because some foods such as bread and chicken become difficult to swallow. It is important for patients to chew well and take time during a meal. It is also important to avoid taking foods with high calorie content that are easy to swallow because that would defeat the purpose of the band. Long-term commitment to healthy eating habits and regular activity are important to guarantee the success of the operation.

Laparoscopic Mini-gastric bypass (LMGB)



The Mini-gastric bypass or single loop gastric bypass is another variation of the gastric bypass. There are two major differences between the MGB & RYGB:

The gastric pouch in the MGB is longer and more importantly there is one connection between the

gastric pouch and the small intestine.

The MGB may have the advantage over the RYGB in being simpler and quicker as an operation. Weight loss seems to be equal among the two procedures with a tendency to have more diarrhea and mal-absorption with the MGB.

The major concern with the MGB is the exposure of the gastric pouch to the irritating juices of the bile and pancreas, which in the long-term might lead to damage, ulcers and possible cancer in the lining of the stomach pouch.

Results

Long-term results with the MGB are similar if not better than RYGB with weight loss of 30-35% of the weight and improvement or resolution of obesity related co-morbidities.

Risks and Side Effects

Immediate serious risks following MGB occur in 3% of patients and include the risk of deep vein thrombosis (blood clots), pulmonary embolus, leak and deep abdominal infection, bleeding and intestinal blockage. Most will appear within the first few days. Some of these complications are best managed with early re-operation. The risk of death is less than 0.3% in experienced bariatric surgical centers such as ours.

Long term side effects include stomach ulcers, gastritis, bile reflux, temporary hair loss, occasional fatigue, anemia, vitamin deficiency, gallstones and loose skin. That is why it is important to maintain regular follow-up and perform blood tests at least twice a year.

Diarrhea and passing gas is a common occurrence after the MGB.

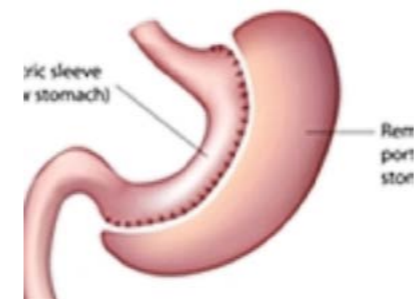
Life after the Lap MGB

The average operation takes about 60 minutes and the average stay in the hospital is around 2 days. The phases of diet include clear fluids for three days, thick fluids for five days and soft food for one week. Thereafter food intake becomes normal. Most patients return to work within 10 days of the operation and resume exercise three weeks later.

Long-term commitment to healthy eating habits and regular activity are important to guarantee the success of the operation.

Laparoscopic Sleeve Gastrectomy (LSG)

Vertical Sleeve Gastrectomy



The Laparoscopic Sleeve gastrectomy has gained popularity around 2005 and has become the fastest growing bariatric operation worldwide. The idea of the sleeve is to reduce the capacity of the stomach by around 70% leaving the rest

of the digestive system intact. Around 70% of the stomach on the left side is removed and the remaining part of the stomach now looks like a tube or a "banana".

Results

Long-term results with the SG closely resemble those of the RYGB with weight loss of 25-30% and improvement or resolution of obesity related co-morbidities.

Risks and Side Effects

Immediate serious risks following LSG occur in 2% of patients and include the risk of deep vein thrombosis (blood clots), pulmonary embolus (PE), leak and deep abdominal infection, bleeding. Most will appear within the first few days. Some of these complications are best managed with early re-operation. Leaks from the staple line can sometimes be managed without an operation using stents but many patients who develop a leak will be best treated by converting the operation into a bypass. The risk of death is less than 0.3% in experienced bariatric surgical

centers such as ours.

Long-term side effects include acid reflux in around 20% of patients. As with all bariatric operations, some patients will regain weight with time. It appears that weight gain is related to re-expansion of the stomach. Vitamin B-12 levels should be monitored regularly to prevent deficiency.

Life after the LSG

The average operation takes about 60 minutes and the average stay in the hospital is around 2 days. The phases of diet include clear fluids for ten days, thick fluids for ten days and soft food for ten days. Thereafter food intake becomes normal. Most patients return to work within 10 days of the operation and resume exercise three weeks later.

Long-term commitment to healthy eating habits and regular activity are important to guarantee the success of the operation.

Laparoscopic Greater Curvature Plication (LGCP)



This operation was described by an Iranian surgeon, Dr. Ahmad Talebpour. In this operation the stomach is folded unto itself in multiple layers to make it smaller and less likely to distend. The operation starts by liberating the

stomach, sealing and dividing all the small blood vessels on the greater curve of the stomach. Folding is then done with multiple sutures in layers. The operation does not require any staples and is done laparoscopically.

Results

The LGCP is a new operation so long-term results are not available. It might be suitable for some patients, especially those who are not very obese and those who have had previous operations and need revisional surgery. More long-term data is needed before we consider the LGCP as a standard bariatric operation.

Risks and Side Effects

Immediate risks following the LGCP include DVT, PE,

perforation of the stomach and bleeding. The risk of mortality related to the operation is low (less than 0.3%). Long-term problems, including weight regain might occur if some of the sutures disrupt. There is also concern that re-operation after the LGCP might be difficult making revisional bariatric surgery in this group of patients potentially risky.

Life after the LGCP

The average operation takes about 60 minutes and the average stay in the hospital is around 2 days. Nausea and vomiting is very common the first few days and more pronounced than in other bariatric operations. The phases of diet include clear fluids for ten days, thick fluids for ten days and soft food for ten days. Thereafter food intake becomes normal. Most patients return to work within 10 days of the operation and resume exercise three weeks later.

Long-term commitment to healthy eating habits and regular activity are important to guarantee the success of the operation.

Biliopancreatic Diversion (BPD)



The main feature that distinguishes the BPD operation is limiting absorption of calories, especially fat by limiting the length of bowel used in digestion of food. In a sense it is more of a radical bypass. On the other hand the stomach is kept a bit on the large side allowing patients to eat larger quantities to avoid protein malnourishment. There are at least two variations to the

BPD including the Scopinaro operation and the duodenal switch.

Results

The long-term results of the BPD are the best in terms of weight loss and resolution of obesity related comorbidities. The average %EWL is around 70-80% even after 10 and 15 years.

Risks and Side Effects

Immediate serious risks following LSG occur in 2% Because of the severe shortening of bowel length side effects related to poor intestinal absorption are quite common. These include diarrhea, foul smelling stools, foul smelling gas, vitamin deficiency, osteopenia, poor vision, protein loss etc. Follow-up of nutritional and vitamin deficiencies is very important.

The Scopinaro operation is easier to perform than the duodenal switch and the risk of complications related to the operation is similar if not less than the RYGB. The duodenal switch on the other hand is more difficult to perform and is associated with the highest risk of major complications and mortality among all bariatric operations.

Life after the BPD

The BPD operations take 2-4 hours to complete laparoscopically. The average length of stay in the hospital is 2 days. The transition of diet from liquids to solids takes about two weeks. Most patients return to work within 10 days and to exercise within three weeks of the operation. As mentioned earlier, long-term nutritional deficiencies are common so it is important to stay on vitamins lifelong and follow-up periodically with blood tests and visits to the doctor.

Summary

Weight loss or bariatric surgery is the only effective treatment of morbid obesity. It not only produces sustainable and substantial weight loss, but also reduces the risk of many obesity related illnesses such as diabetes, heart disease and certain cancers. It has been shown to increase longevity, productivity and improve quality of life. Most WLS is done laparoscopically with low risks if done in specialized centers. WLS should not be viewed as a simple and final cure of obesity, rather than a component of a multi-disciplinary treatment that relies on the patient.



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