

Diabetes, Obesity, and Other Medical Diseases – Is Surgery the Answer?

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ABSTRACT

For many physicians, the concept of surgery as the best treatment for a medical disease such as diabetes, cardiovascular problems, hyperlipidemia, sleep apnea, hepatos-teatosis, GERD, osteoarthritis, psoriasis, rheumatoid arthritis, or infertility, still sounds wrong and just a ploy by surgeons to increase their business. Since 2011, however, several non-surgical societies have recommended Weight Loss Surgery – The International Diabetes Federation, The American Diabetes Association, American Heart Association, and Obesity Society in 2015 for patients with body mass index (BMI) greater than 35 and diabetes, and to decrease cardiovascular risk factors.¹

The concept is to treat the common underlying problem, which is obesity, with the most effective method for immediate and long-term weight loss, which is surgery. The term “metabolic” surgery was therefore coined to accurately describe the effects of weight loss (bariatric) surgery. Our specialty society named itself the American Society for Metabolic and Bariatric Surgery (ASMBS).

KEYWORDS: bariatric surgery, diabetes, hypertension, mortality, disease

INDICATION AND RISK

Surgery is indicated for patients with a Body Mass Index (BMI) of 35 or higher and obesity-related comorbidities or for patients with a BMI of 40 or higher without comorbidities.¹² Currently, the surgeries are done almost exclusively laparoscopically, by experienced surgeons at American College of Surgeons (ACS) designated Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) Accredited-Comprehensive Center. With these standards, the complication rate has decreased to 3% for diabetics, which is the same as gallbladder surgery and much lower than for total knee replacement (16%), leg bypass (24%) or heart bypass (47%) in otherwise similar populations.³

In our MBSAQIP Accredited-Comprehensive Center, the morbidity rate in the last 12 months was 2.7% with half of these due to nausea only. Readmission rate was 3%, reoperation rate 0.3% and mortality has been 0% since 2003 for primary bariatric procedures and no previous surgery in the abdomen.

TYPES OF SURGERY

The ASMBS estimates that in the US in 2015 bariatric surgery was performed on 196,000 patients. This represents only 1.25% of all estimated 16Mill patients with BMI greater than 40.⁴ The types of bariatric surgery have changed over the years. In 2015 the majority of surgeries involved the sleeve gastrectomy with 54%, then the Roux-en-Y gastric bypass with 23%. The rest were revisions, gastric band, biliopancreatic diversion, balloons etc.

Laparoscopic Sleeve Gastrectomy (SG)

The sleeve gastrectomy has been used since early 2000. It consists of a resection of about 75% of the stomach, leaving behind a thin stomach from the esophagus to the pylorus. The resulting stomach resembles a banana and holds about 2-3 oz. The effect is a marked decrease in portion size and the loss of hunger during the first year. Some patients will not feel hungry for years due to a lack of Ghrelin, the hunger hormone, which was produced in the removed part of the stomach. There is also a metabolic effect as a result of faster passage of food through the new, smaller stomach. Food reaches the duodenum, jejunum and ileum faster and in a less digested fashion. This in effect leads to an increased production in glucagon-like peptide 1 (GLP1), gastric inhibitory polypeptide (GIP), peptide YY (PYY), and other digestive enzymes, which help in improved regulation of glucose homeostasis. Long-term side effects are rarely seen and limited to Vitamin B12 and iron deficiency.

Laparoscopic Gastric Bypass

The gastric bypass has been performed since the 1960s in various forms and in the current laparoscopic form since 1993. It consists of the creation of a 15-30cc new stomach – resembling a thumb – and the stapling, cutting and reorganization of the jejunum. The result is that food passes from the esophagus through the small stomach pouch, through a narrow anastomosis directly into the jejunum. Food bypasses the old stomach remnant, the duodenum, and the proximal jejunum. The result is a marked decrease in portion size, a loss of hunger due to the decreased production of Ghrelin, and an even more beneficial change in the homeostasis of many humoral factors such as GLP1, GIP, PYY than in the sleeve gastrectomy that lead to the positive effect on many medical problems. There are also changes of nerve pathways and the microbiome after the gastric bypass, which lead to metabolic changes and eating behavior modification.

Long-term side effects are infrequent and involve iron deficiency, hypoglycemia, and anastomotic ulcer.

Other Surgeries

The **gastric band** was used frequently in the past, but has recently been used rarely because it does not provide significant, short or long-lasting effects in many patients but leads to further operations in 50% of the patients to either treat problems or to remove the band completely with or without another weight loss operation. Only a few surgeons in RI still offer the band.

The **biliopancreatic diversion**, duodenal switch surgery is very effective but leads to more malabsorption and requires intense follow-up. This surgery is not performed anywhere in New England.

The **balloons** have been approved in the USA for about one year. They are approved by the FDA for persons with BMI 30-40, and lead to weight loss of 10-20%. They need to be removed after 6 months, at which point the patient needs to have changed their lifestyle to maintain weight loss, and are currently not covered by insurance. At this time, Roger Williams Medical Center is the only program that offers the balloon.

WEIGHT LOSS

Sleeve gastrectomy and gastric bypass patients lose weight in a similar fashion. As opposed to every other weight-loss method, 100% of patients lose weight for several years, which initially happens fast and continues for about a year. After the first year, the average weight loss is about 70% of excess weight. More importantly, after 5 years the average weight loss is still about 50-70% of excess weight.

Stated differently, as percentage of total body weight lost, The Swedish Obesity Subjects trial (SOS), which looked at 2010 surgical patients and at 2037 non-surgical patients and has a >90% follow-up rate, shows total weight loss for gastric bypass to be at 32% after 2 years, 25% after 10 years, and 27% after 15 years. Weight loss stayed stable after 8-10 years. The matched control group that did not have surgery had weight loss of 0%, 1%, and -1% at these time intervals.⁵

METABOLIC MEDICAL DISEASE IMPROVEMENTS AFTER SURGERY

Diabetes Type 2

We frequently see that patients who are on oral diabetes treatment and often even on insulin, are discharged after surgery off all medications.

The SOS has the best long-term data. The remission rate after weight-loss surgery was 72% at 2 years, 36% at 10 years, and 30% at 15 years, compared to 21, 13, and 7% respectively for the control group of patients without surgery.⁶ Even in poorly controlled diabetics with a HgbA1C of >9%, the complete remission to a HgbA1C <6% was achieved in 42% after gastric bypass and 37% after sleeve

gastrectomy compared to only 12% of patients with intense medical therapy.⁷ Surgery also prevented the occurrence of diabetes overall with a relative risk reduction of 78%. There were also decreased microvascular and macrovascular complications. Although the impact of surgery on diabetes is unfortunately not perfect, surgery is clearly more beneficial in the short and long term.

Mortality

The mortality rate for obesity surgery is very low (0.3%). In our hospital it was 0% since 2003 for primary bariatric procedures and no other surgery in the upper abdomen. In addition, many studies have shown that the survival benefit for patients begins within 2 years of surgery. Several studies have shown a reduction in the 5-year relative risk of death from 50% up to 89%. The relative risk for a surgical patient to die was only 0.11 compared to a non-surgical patient. This means the risk for an obese patient to die without surgery is up to 8 times higher than with surgery.^{2,5,8}

Hypertension

We frequently discontinue or reduce anti-hypertension medication at discharge from the hospital, because patients report dizziness and light-headedness at home due to lower blood pressure. Hypertension is either in complete remission or improved in 60-70% even after 5 years.¹

Osteoarthritis

Weight causes a high amount of pressure on joints and lower extremity and back pain is frequently seen in obese patients. Obesity surgery decreases the number of patients who report joint pain by 50%, even years after the surgery. Furthermore, many orthopedic surgeons will not perform arthroplasties or back surgery above a certain BMI. Besides the fact that complication rates for arthroplasty are much higher than for weight-loss surgery, the arthroplasty also does not lead to a comparably good result in a morbidly obese person compared to a non-obese person. A recent study showed that bariatric surgery two years before a knee replacement tends to lead to fewer complications, and improved quality of life after the knee replacement.⁹

Fatty liver

Almost all male patients and the majority of female morbidly obese patients have at least nonalcoholic fatty liver disease (NAFLD), but in about 30% the fatty liver disease has progressed to nonalcoholic steatohepatitis (NASH), and rarely cirrhosis.¹¹ Depending on the stage of the disease obesity surgery leads to either complete resolution of NAFLD or improvement of fibrosis and inflammation. Liver disease due to obesity is becoming one of the most frequent reasons for liver transplant. Prevention with obesity surgery is extremely beneficial.

Hyperlipidemia

A joint scientific statement by the National Lipid Association, the Obesity Medicine Association and the ASMBS published in the January/February 2016 issue of the *Journal*

of *Clinical Lipidology* states that bariatric surgery is effective in improving cholesterol and lipid levels, which are important risk factors for cardiovascular disease.⁴

Sleep apnea (OSA)

Obesity is the cause of more than 50% of sleep apnea cases. CPAP treats OSA but the patient adherence is not very good and CPAP does not treat the cause. Weight loss is the most successful treatment of OSA. Weight loss surgery results in the highest weight loss and best weight maintenance and consequently in the most successful OSA treatment.

Cancer

The SOS and other studies also looked at cancer incidence. Overall the relative risk of cancer after surgery was 0.55%. In other words, patients after obesity surgery get only half as many cancers as patients without surgery. Surprisingly, this benefit was almost exclusively seen in women. Men had hardly any benefit.

Rheumatoid arthritis

In a group of patients the remission rate was 26% before surgery and at a mean of 5.8 years after surgery 74%. ESR, CRP and related medicines were lower as well.¹⁰

Other

We also see many other diseases improve after surgery such as infertility, GERD, asthma, shortness of breath, and pseudotumor cerebri. There are reports of 100% restoration of menstruation in polycystic ovarian syndrome PCOS and 50% reduction of migraine days.

COST

The many benefits of weight-loss surgery are also reflected in a decrease in patient care cost. A recent study showed that bariatric surgery decreases cost per patient after surgery. The cost decrease for each of 4 years post-op was 12% for the first year, 28% for the second year, 37% for the third year, and 35% for the fourth year. This amounted to \$7,592 over 4 years. For diabetics the cost decrease was 23%, 49%, 61%, 69%, respectively, and \$22,609 total.¹³

SUMMARY

In summary, bariatric surgery is currently one of the lowest risk surgeries and produces greater long-term benefits than any other intervention for obesity.

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Disclosures

None

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