

Revisional Bariatric Procedures

Essay

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَقُلْ اَعْمَلُوا فَسَيَرَى اللَّهُ
عَمَلَكُمْ وَرَسُولُهُ وَالْمُؤْمِنُونَ

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Abstract

Obesity is the most common form of malnutrition in developed countries. Prevalence of obesity is rising to an epidemic proportion around the world. Obesity increases the risk of medical illness and premature death and thus imposes an economic burden on the health care system. Many morbidities are underlying causes for the earlier mortality associated with obesity including coronary artery disease, hypertension, impaired cardiac function, adult onset diabetes mellitus, venous stasis and hypercoagulability leading to an increased risk of pulmonary embolism.

The most widely accepted measure of obesity is the body mass index (BMI) which equals patient weight in kilograms divided by the square of his or her height in meters, a normal BMI ranges from 18.5-24.5 kg/m², overweight equals BMI between 25-29.5 kg/m², obesity equals BMI 30 kg/m² or higher.

Treatment of morbid obesity should begin with simple lifestyle changes, including moderation of diet and initiation of regular exercise such as walking and pharmacological management. The most pronounced weight loss is obtained by bariatric surgery which has different techniques that are divided mainly into two groups: restrictive procedures (include sleeve gastrectomy, vertical banded gastroplasty and adjustable gastric banding) and malabsorptive procedures (include Roux En Y gastric bypass, mini gastric bypass, bilio pancreatic diversion and duodenal switch). In general, restrictive procedures are simpler to perform and are accompanied by less procedural complications than malabsorptive procedures. Open surgery has largely been replaced by a laparoscopic approach.

Key words: Revision, RECo, Bariatric procedure, Reoperative Bariatric surgery

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List of Abbreviations

ASMBS	American Society of Metabolic and Bariatric Surgery
BED	Binge eating disorder
BMI	Body Mass Index
BPD	Biliopancreatic diversion
BPD-DS	Biliopancreatic diversion with duodenal switch
CHD	Coronary Heart Disease
CNS	Central nervous system
CRH	Corticotrophic releasing hormone
DS	Duodenal Switch
DVT	Deep Vein Thrombosis
ECG	Electrocardiogram
EWL	Excess weight loss
FDA	U.S. Food and Drug Administration
GERD	Gastroesophageal Reflux Disease
GLP-1	Glucagon-like peptide 1
HDL	High density lipoprotein
ICSSG	International Consensus Summit on Sleeve Gastrectomy
IVC	Inferior vena cava
JIB	Jejunioileal bypass
LAGB	Laparoscopic adjustable gastric banding
LCDs	Low calorie diets
LDL	Low- density lipoprotein
LOS	Length Of hospital stay

List of Abbreviations

LRYGB	Laparoscopic Roux-en-Y gastric bypass
LSG	Laparoscopic Sleeve Gastrectomy
NIDDM	Non insulin dependent diabetes mellitus
NOTES	Natural orifice transluminal endoscopic surgery
NPO	Nothing-by-mouth
NPY	Neuropeptide Y
OTSC	Over-the-scope clip
PCOS	Polycystic ovarian syndrome
PE	Pulmonary Embolism
PVN	Paraventricular nuclei
RYGB	Roux-en-Y gastric bypass
SG	Sleeve gastrectomy
T2DM	Type 2 Diabetes Mellitus
UBO	Upper body obesity
VBG	Vertical banded gastroplasty
Vd	Volume of distribution
VLCDs	Very low calorie diets
VLDL	Very low density lipoprotein
VMN	Ventromedial nuclei
WHR	Waist/hip circumference ratio

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Introduction

Obesity is a serious, progressive disease with medical, social, psychological and economic Consequences. It's usually defined in terms of body mass index (BMI), which is the individual body mass in kilogram divided by the square of their height in meters (kg/m^2). The World Health Organization, the National Institutes of Health and the 2000 Dietary Guidelines for Americans, proposed guidelines for the classification of weight status based on the BMI. BMI of 35 is considered class 1 obesity, 35-40 as class 2, and over 40 as class 3. Morbid obesity is usually defined as a BMI of over 40 or a BMI over 35 in combination with co morbidities (*Gorber et al., 2007*). More than 400 million individuals worldwide are obese (*WHO, 2006*). In the United States, 2% of men and 6% of women are morbidly obese and have mortality rates up to 12 times greater than normal weight individuals (*Martin et al., 2007*).

Treatments for obesity include a range of therapies, such as dietary advice and physical activity, behaviour therapy, pharmacological therapy and bariatric surgery. The most pronounced weight loss is obtained by bariatric surgery as presented in a recent Cochrane review (*Colquitt et al., 2009*). An increasing number of patients require

revision of failed operation, this comprises about 5%-15% of total cases of bariatric surgery (*Radtka et al., 2010*). The rate of revisional surgery is 20%-60% after LAGB (laparoscopic adjustable gastric banding) (*O'Brien et al., 2013*), 9%-17% after RYGB (reux en y gastric bypass) (*Himpens, et al., 2012*) and 9%-11% after SG (sleeve gastrectomy) (*van Rutte et al., 2012*).

Revision of primary bariatric surgery is mainly either due to inadequate weight loss or weight regain (*Gumbs et al., 2006*). Other indications may be specific to the type of operation, for example, the most common cause of revisional surgery after jejunio-ileal bypass is malabsorption, which can lead to liver failure and death (*Lowell et al., 1997*). In VBG (vertical banded gastrplasty), the cause of revision may be symptomatic gastroesophageal reflux disease, staple-line disruption leading to gastro-gastric fistula and gastric outlet obstruction due to stenosis and food impaction (*Gonzalez et al., 2005*). In AGB (adjustable gastric banding), the cause of revision may include hardware problems with the band itself, such as erosion and slippage, motility problems resulting in esophageal dilatation and psychological intolerance to the band (*van Wageningen et al., 2006*). Problems specific to RYGBP (reux en y gastric bypass)

include intractable marginal ulceration and gastro-gastric fistulization requiring surgical intervention (*Gumbs et al., 2006*).

Revisional bariatric procedures have different modalities that may be summarized as follow:

In case of Vertical Banded Gastroplasty, conversion to RYGBP may be needed in case of inadequate weight loss, presence of gastro gastric fistula or gastro esophageal reflux symptoms (*Gagner and Boza, 2006*). AGB may be needed in case of large gastro gastric fistula (*Gavert et al., 2004*), while DS is done in case of the super-obese (BMI >50) (*Yashkov et al., 2001*).

From AGB, the available options are conversion to RYGBP in case of inadequate weight loss (*Van Wageningen et al., 2006*). Removal of band (*Keidar et al., 2005*), Leaving band in place or conversion to DS in the super-obese (BMI >50) (*De Csepel et al., 2002*).

In case of RYGBP, Placement of AGB may be needed (*Marc Bessler et al., 2009*) or conversion to DS in the super-obese (BMI >50) (*Parikh et al., 2008*).

From Jejunio-ileal Bypass, Reversal is done in the setting of malnutrition (*Buchwald bariatric surgery, 2005*) while Reversal and Revision is done in the setting of

inadequate weight loss, conversion to RYGBP or Gastric Sleeve followed by DS (duodenal switch) may be done or placement of AGB (*Nguyen et al., 2005*).

The key to prevent long term weight regain and to reduce bariatric surgery complications is to learn and address potential pitfalls early. several behaviors have been proven to reduce the chance of weight gain after bariatric surgery that include Joining and participation in a good weight loss surgery support group which may roughly decrease body mass index by 10% more than that in patients who don't (*Orth et al., 2008*). Stopping binge eating well before surgery will lead to less weight gain after bariatric surgery (*Sallet, et al., 2007*). Losing as much weight as possible prior to surgery is important as body mass index (BMI) prior to surgery directly relates to how much weight you'll lose and keep off (*Christou et al., 2006*). Treatment of alcohol and drug abuse problems as they will cause weight gain after bariatric surgery and potentially lead to bariatric surgery complications (*Faria et al., 2007*). Continuation of getting nutritional counseling from surgeon-referred dietitian or nutritionist will lead to better long-term results (*Faria, et al., 2007*).

With the advancement of laparoscopic surgical skills, several studies have recently demonstrated that laparoscopic revision can be performed safely by well-trained and highly experienced bariatric surgeons in specialized bariatric centers (*Victorzon, 2012*). Although The complications of laparoscopic revision are reportedly 14.3%-46.3% compared with 3-27.8% of laparotomic one laparoscopic approach could provide a better vision with a close view and better dealing with deeply seated intra abdominal organs facilitating more precise dissection than laparotomic one (*van dessel and Hubens, 2008*).