Management of complications of the bariatric procedures

Essay

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By

Mootaz Mahmoud El Husseini Mohamed

M.B.B.CH

Ain Shams University

Under supervision of

Prof. Dr. Alaa AbbasSabry

Professor of General Surgery
Faculty of Medicine
Ain Shams University

Dr. Medhat Mohamed Helmy

Lecturer of General Surgery
Faculty of Medicine
Ain Shams University

Ain Shams University
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List of abbreviations

ACCP	American college of chest physicians
AGB	Adjustable gastric band
BIB	BioEntericsintragastric balloon
BMI	Body mass index
BP	Blood pressure
BPD	Biliopancreatic diversion
BPD/DS	Biliopancreatic diversion with duodenal switch
BS	Bariatric surgery
CHD	Congestive heart failure
CT	Computed tomography
CVD	Cardiovascular Diseases
DGRY	Derivation gastrojejunal Roux-en-Y
DJBS	Duodenojejunal bypass sleeve
DM	Diabetes mellitus
DVT	Deep venous thrombosis
EGD	Esophago-gastro-duodenoscopy
EVG	Endolumenal vertical gastroplasty
EWL	Excess weight loss
GCS	Graduated compression stockings
GE	Gastroesophageal
GEB	Garren-Edwards bubble
GERD	Gastroesophageal reflux disease
GI	Gastro intestinal
GIB	Gastrointestinal bleeding
GIP	Glucose-dependent insulinotropic peptide
GJ	Gastro-jejunostomy
GLP-1	Glucagon like peptide - 1
GRY	Gastrojejunal Roux-en-Y
GSHS	Global School-based Student Health Survey
HDL	High density lipoprotein
HDL-C	High density lipoprotein cholesterol
HTN	Hypertension
ICDs	Intermittent compression devices
IHD	Ischemic heart diseases
LAGB	Laparoscopic adjustable gastric band
LDL	Low density lipoprotein
LMGB	Laparoscopic mini gastric bypass
LMWH	Low molecular weight heparin

LRYGB	Laparoscopic Roux-en-Y gastric bypass
LSG	Laparoscopic sleeve gastrectomy
MGB	Mini gastric bypass
MO	Morbid obesity
NHLBI	National Heart, Lung and Blood Institute
NICE	National Institute of Health and Clinical Excellence
NIH	National institute of health
NOTES	Natural orifice transluminal endoscopic surgery
NSAIDs	Non-steroidal anti-inflamatory drugs
OHS	Obesity hypoventilation syndrome
OSA	Obstructive sleep apnea
PA	Physical activity
PE	Pulmonary embolism
POD	Post-operative day
PTH	Parathyroid hormone
PYY	Peptide YY
RRYGB	Robotic Roux-en-Y gastric bypass
RYGB	Roux-en-Y gastric bypass
SAS	Sleep apnea syndrome
SEMS	Self-expandable metal stent
SG	Sleeve gasterctomy
TERIS	Trans-oral endoscopic restrictive implant system
TG	Triglycerides
TOGA	Transoralgastroplasty
UGBS	Upper gastrointestinal barium study
UGI	Upper gastrointestinal
US	United States
VBG	Vertical banded gastroplasty
Vit	Vitamin
VLDL	Very low density lipoprotein
VTE	Venous thromboembolism
WHO	World Health Organization

Introduction

Obesity has become a global epidemic and more than 400 million individuals worldwide are obese.***(Organization WH., 2006)*** Obesity is associated with an increased risk for type 2 diabetes, hypertension, dyslipidaemia, cardiovascular diseases, musculoskeletal disorders (such as osteoarthritis), certain types of cancer, and mortality**.** ***(Picot et al., 2009)***This entails huge healthcare costsdue to obesity.***(Allender and Rayner, 2007)***

Obesity is usually defined in terms of body mass index (BMI), defined as 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, Healthy People 2010, 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 comorbidities. ***(Gorber et al., 2007)***

Morbid obesity (MO) has been defined as a chronic and multifactorial disease associated with remarkable physical and psychological complications, which can negatively affect quality of life and shorten life expectancy**.*****(Rubio et al., 2007)*** A recent

study on the association between different grades of obesity and the number of life-years lost indicated that life expectancy can be up to 20 years shorter in severe obesity.***(Fontaine et al., 2003)***

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)*** The surgical procedures related to obesity started in the mid 20th century with the first malabsorptive technique. Since then more than 30 procedures have been developed. ***(Arribas et al., 2001)***

Bariatric surgery has proven to be the most effective method of treating severe obesity**.** ***(Sjostrom et al., 2007)***Nevertheless, the acceptance of bariatric surgery is still questioned by the medical community and among the general population, who do not recognize obesity as a disease that exhibits great complexity, is of multifactorial origin, and is difficult to control. This prejudice is reinforced when severe complications arise from surgery and is certainly enhanced by the occurrence of mortality, given that young and supposedly "healthy" individuals are often subjected to surgery.***(Kaminsky and Gadaleta, 2002)***

Laparoscopy has revolutionised the world of bariatric surgery. Studies to date demonstrate a great many advantages of this type of approach in comparison to open surgery. Nevertheless, laparoscopic bariatric surgery continues to be associated with post-operative complications and mortality. ***(Podnos et al., 2003)***

The risk of complications and mortality in bariatric surgery is associated with certain factors that are common to other patients and procedures, including age above 65 years, the presence of associated diseases (cardiovascular and pulmonary disease, chronic renal failure, liver cirrhosis, etc.), prior abdominal surgery and the experience of the surgeon and the institution, especially concerning the ability to make an early diagnosis and address complications.***(O'Keefe et al., 2010)***

With early recognition and appropriate management, postoperative bariatric complications are generally non-lethal and minor. However, left untreated, they may result in devastating complications. It is therefore critical that all health care professionals responsible for bariatric patients recognize the signs and symptoms, know the proper diagnostic maneuvers, and institute the correct treatment in a timely fashion.***(Scott et al., 2008)***

Aim of work

The aim of this work is to discuss the early and late post-operative complications after different bariatric procedures, how to diagnose and how to correct, with special focus on the role of minimally invasive procedures (laparoscopy / endoscopy) in the management of these complications.

Definition of obesity

Since the dawn of mankind, the survival of the speciestheory mandates the adaptation of complex mammalianbodies to harsh climates and unfavourable environments.With abundant nutrition, sedentary lifestyle and moderntransportation amongst many other comforts of urbanisation,many of the overweight and obese men today would beunrecognisable from the common man in the days ofSocrates, Leonardo Da Vinci and even Thomas Edison.

Obesity is a state of excess adipose tissue mass. Although often viewed as equivalent to increased body weight, this need not be the case-lean but very muscular individuals may be overweight by numerical standards without having increased adiposity. Body weights are distributed continuously in populations, so that choice of a medically meaningful distinction between lean and obese is somewhat arbitrary. Obesity is therefore more effectively defined by assessing its linkage to morbidity or mortality. ***(Flier and Flier, 2008)***

The World Health Organization defines overweight as a body mass index (BMI) of 25 or more and obesity as a BMI of 30 or more. Obese patients are further categorized into class I (BMI

30–34.9), class II (BMI 35–39.9) and class III (BMI 40 or more). ***(Can, 2013)***As seen in **table (1)**.

Although BMI correlates with the amount of body fat, it must be recognized that BMI does not directly measure body fat, nor does it differentiate fat from muscle. This limits the accuracy of BMI in diagnosing obesity, particularly in the intermediate range, as well as in men and older adults in general. A BMI cutoff of 30 kg/m2 or greater has good specificity but misses many patients with excess body fat.***(Goacher et al., 2012)***

Calculating BMI is still a good way to evaluate changes over time, because incremental increases most likely represent gains in body fat.***(Romero et al., 2008)***

Recognizing that BMI is just one indicator of potential health risks associated with being overweight or obese, the National Heart, Lung and Blood Institute (NHLBI) recommendsthat physicians also look at the following factors: ***(Institute for Clinical Systems Improvement. 2011)***

• Risk factors for diseases associated with obesity, such as high blood pressure and physical inactivity

• Waist circumference as a measure of abdominal adiposity