Canadian Journal of Cardiology 31 (2015) 153–166

Review

How to Choose and Use Bariatric Surgery in 2015

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ABSTRACT

Severe obesity is associated with increased morbidity and mortality and represents a major health care problem with increasing incidence worldwide. Bariatric surgery, through its efficacy and improved safety, is emerging as an important available treatment for patients with severe obesity. Classically, bariatric surgery has been described as either a restrictive or a hybrid surgery, which is a combination of restriction and malabsorption. For most severely obese patients, bariatric surgery results in the remission of major obesity-related comorbidities including type 2 diabetes mellitus, sleep apnea, hypertension, and dyslipidemia. Thus, bariatric surgery reduces cardiovascular risk burden, and overall mortality risk. Early complications (< 30 days) after bariatric surgery were reported to be < 10% and tend to be lower in restrictive surgeries compared with hybrid surgeries. Most common early complications reported are gastric and anastomosis leak (1.6%-5.1%), bleeding (0.5%-3.5%), and pulmonary embolism (0.2%-1%). Long-term complications (> 30 days) might differ depending on the type of bariatric surgery. According to the type of surgery and the type of study, the 30-day operative mortality rates differ from 0.1% to 1.2%. Studies on postoperative outcomes, investigations on weight loss physiology, and mechanism of action after bariatric surgery provide a

RÉSUMÉ

L'obésité sévère est un problème de santé majeur, associée à une morbidité et à une mortalité augmentées, dont son incidence mondiale ne cesse d'augmenter. La chirurgie bariatrique est le seul traitement considéré efficace et sécuritaire pour les patients ayant une obésité sévère. Il existe 2 types de chirurgie bariatrique: 1) les chirurgies restrictives impliquant seulement une restriction à l'estomac ou 2) les chirurgies mixtes impliquant une restriction ainsi qu'une malabsorption des aliments. Pour une majorité de patients avec obésité sévère, la chirurgie bariatrique conduit à une rémission des principales comorbidités associées à l'obésité incluant le diabète de type 2, l'apnée du sommeil, l'hypertension artérielle et la dyslipidémie, contribuant ainsi à diminuer le risque cardiovasculaire et la mortalité. En général, le taux de complications à court terme (< 30 jours) est plus faible suite à une chirurgie restrictive comparativement à une chirurgie mixte et a été rapporté comme étant inférieur à 10%. Les complications à court terme (< 30 jours) les plus fréquemment rapportés sont les fuites dans l'anastomose gastrique (1,6 à 5,1%), les saignements (0,5% à 3,5%) et l'embolie pulmonaire (0,2 à 1%). Quant aux taux de complications à long terme (> 30 jours) rapportés dans la littérature, ils varient selon le type de chirurgies ainsi que le type

The environment in which we evolve, that some describe as "obesogenic," promotes a sedentary lifestyle, high caloric intake, creates positive energy balance (energy expenditure < energy intake), weight gain, increased body mass index (BMI), and increased fat mass.[1] Excessive consumption of calories, but also bad food choice is responsible for energy intake increase.[2] The terms, overweight, obese, and severe obesity refer to a clinical continuum. The standard classification of obesity is expressed in terms of BMI. Obesity is defined as a BMI $\geq$ 30 kg/m^2 and might be further subdivided into classes (Table 1).[4] The prevalence of obesity is increasing as it reaches epidemic worldwide proportions with a worrying trend toward severe obesity (Fig. 1).[6,7] This is not without effect on public health. At least 2.8 million people die each year as a result of being overweight or obese.[6] In 2012, 18.4% of Canadians aged 18 and older reported heights and weights that classified them as obese. If we combine with individuals who are overweight (41.3% of men and 26.9% of women), 59.9% of Canadian men and 45.0% of Canadian women have an increased health risk because of weight excess.[8] Chronic accumulation of body fat excess leads to a variety of metabolic changes. Indeed, obesity, more specifically body fat distribution, namely visceral obesity, is associated with an increased risk of developing several risk factors for cardiovascular disease (CVD), but also affects system that

Received for publication October 21, 2014. Accepted December 3, 2014.

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See page 161 for disclosure information.

http://dx.doi.org/10.1016/j.cjca.2014.12.014

better understanding of the bariatric surgery metabolic benefits. In this article, we present an overview of bariatric procedures with their effects, including risks and benefits, on the severely obese patients' health. It provides evidence to support surgical treatment of severe obesity to achieve cardiovascular disease risk reduction in severely obese patients.

d'étude. Le taux de mortalité post-opératoire à 30 jours varie entre 0,1 à 1,2%. Les études évaluant spécifiquement les mécanismes associés à la perte de poids et à la rémission des comorbidités associées à l'obésité sévère fournissent une meilleure compréhension des effets métaboliques de la chirurgie bariatrique et de ses complications. Cet article présente un aperçu des principales chirurgies bariatriques et résume les principaux risques et avantages de ces chirurgies sur la santé cardiovasculaire chez des patients avec une obésité sévère. Il fournit également des évidences cliniques favorables à effectuer la chirurgie bariatrique pour réduire le risque cardiovasculaire chez ces patients.

modulate inflammation.[9] Obesity promotes hypertension, dyslipidemia, insulin resistance, sleep apnea, type 2 diabetes mellitus, and induces a variety of structural adaptations in cardiovascular functions.[10]

The annual economic burden of obesity in Canada is not without consequences and has experienced increased growth between 2000 and 2008 from 3.9 to 4.6 billion dollars.[11] A relationship exists between severe obesity and all-cause mortality[12] and it is well known that morbidity and mortality rates increase proportionally with the degree of obesity in men and women.[4] White women 20 to 30 years old with BMI $\geq$ 45 kg/m^2 will lose 8 years of life and their male counterparts will lose 13 years.[4] With its many adverse effects on cardiovascular health in addition to a diminished quality and quantity of life, the increased prevalence of severe obesity is alarming. Sustainable weight loss requires a comprehensive strategy that encompasses nutrition, exercise, emotional, and cognitive aspects. Basically, there are 3 principal treatments for severe obesity: (1) changes in lifestyle habits, (2) pharmacotherapy, and (3) bariatric surgery. Available literature shows that, in the presence of severe obesity, the only treatment that allows a significant substantial long-term weight loss and that cures or durably improves comorbidities is bariatric surgery. A variety of bariatric surgery procedures are available to treat severe obesity. In this article, we present an overview of the procedures with their effects, and risks and benefits, on the severely obese patients' health.

Indication for Bariatric Surgery

There are several guidelines describing eligibility for bariatric surgery, most of which are somewhat similar. The National Institutes of Health, the American Diabetes Association,[13] the International Diabetes Federation,[14] and other organizations[15,16] issued consensus statements identifying bariatric surgery as the only proven effective option for sustainable weight loss and weight control inducing beneficial clinical outcomes in severe obesity.[17] They have proposed bariatric surgery therapy for adult patients with BMI $\geq$ 40 kg/m^2 or BMI $\geq$ 35 kg/m^2 with obesity-related comorbidities such as systemic hypertension, type 2 diabetes, and obstructive sleep apnea that are difficult to control with lifestyle and pharmacotherapy. All guidelines emphasized a general statement indicating that all candidates must have tried and failed appropriate nonsurgical weight loss measures. The risk-benefit ratio needs to be adequately evaluated and explained for each individual. Currently, there is no clear consensus regarding the upper age limit and the possible cardiovascular, pulmonary, and/or endocrine contraindications to bariatric surgery. These issues should be treated one on one with the surgeon and other specialists at the time of the preoperative evaluation. Exclusion criteria to bariatric surgery include current drug or alcohol abuse and an uncontrolled and severe psychopathologic condition, which prevents patients to understand the risks, benefits, expected outcomes, and lifestyle changes required with bariatric surgery.[18]

Patients referred for bariatric surgery should undergo a comprehensive medical history, physical examination, blood chemistry, 12-lead electrocardiogram, chest radiograph, and formal pulmonary function testing if clinically indicated.[19] For patients with known cardiac disease and patients who

Table 1. Classification of body weight

Classification	Body mass index value
Underweight	< 18.5
Normal or acceptable weight	18.5-24.9
Overweight	25-29.9
Obese	$\geq$ 30
Grade 1	30-34.9
Grade 2	35.0-39.9
Grade 3	$\geq$ 40 (severe, extreme, or morbid obesity)
Grade 4	$\geq$ 50
Grade 5	$\geq$ 60

Body mass index calculated as weight (kg)/height (m^2).
Data from Poirier et al.[3]

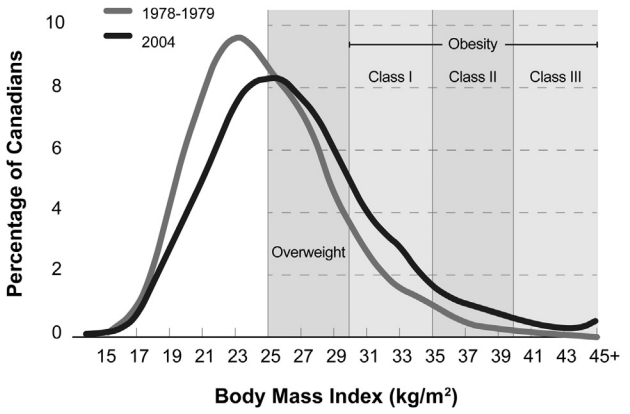

Figure 1. Evolution, between 1978 and 1979 to 2004, of the percentage of Canadians according to each class of body mass index. © All rights reserved. *Canadian Guidelines for Body Weight Classification in Adults*.[5] Health Canada, 2003. Modified and reproduced with permission from the Minister of Health, 2014.