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Bariatric surgical options and future directions

Many patients with obesity-related comorbidities meet the criteria for bariatric surgery but do not pursue treatment, even though excellent outcomes are possible with procedures such as the laparoscopic vertical sleeve gastrectomy and Roux-en-Y gastric bypass.

ABSTRACT: Bariatric surgery is now accepted as a safe and effective procedure for severe obesity. Despite excellent outcomes with current procedures, most patients with obesity-related comorbidities who meet the criteria for surgery do not pursue treatment. Common bariatric procedures performed in Canada are vertical sleeve gastrectomy and Roux-en-Y gastric bypass. A less common procedure is biliopancreatic diversion with a duodenal switch. All of these procedures are performed laparoscopically and require dietary and behavior modification along with education and support from a multidisciplinary team of experts. Patients face some challenges in accessing bariatric surgery that could be addressed by increasing awareness of surgical options. Efforts should be made in BC to support bariatric surgery programs that are accessible to both referring physicians and patients.

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The adverse effects of obesity impact every aspect of the health care system. Studies have demonstrated that diet, lifestyle modifications, and currently available pharmaceutical agents are relatively ineffective in treating severe obesity in the long term.[1] Bariatric surgery is the only evidence-based approach for sustainable weight loss in patients with severe obesity. It is proven to be safe and effective for comorbid disease resolution and to reduce health care costs.[2] A consensus statement updating an earlier statement from the National Institutes of Health supports bariatric surgery for those who strongly desire substantial weight loss and have obesity-related comorbidities.[3] The 2nd Diabetes Surgery Summit (DSS-II) guidelines state that bariatric surgery should be considered for patients with type 2 diabetes and a BMI of 30.0 kg/m^2 to 34.9 kg/m^2 if hyperlycemia is inadequately controlled despite optimal treatment with either oral or injectable medications.[4] Despite such recommendations and the excellent outcomes with current procedures, most obese patients with obesity-related comorbidities who meet the criteria for surgery do not pursue treatment.

Bariatric procedures have traditionally been classified as restrictive, malabsorptive, or a combination of both. Restrictive procedures reduce the storage capacity of the stomach and lead to decreased caloric intake. Malabsorptive procedures reduce the functional length of the small intestine and lead to decreased absorption of nutrients. Evidence is emerging that another mechanism involving gut hormones plays a significant role, an understanding that is reducing the utility of the traditional classification system.

Regardless of which surgical option is chosen, success requires dietary and behavior modification as well as education and support from a multidisciplinary team of experts. The two most common bariatric procedures in Canada are vertical sleeve gastrectomy (VSG) and Roux-en-Y gastric bypass (RYGB), all of which are performed laparoscopically (**Figure**). Laparoscopic adjustable gastric band (AGB) is still offered, but is no longer being performed as frequently as it once was due to poor

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long-term success rates. In British Columbia, RYGB and VSG are covered by MSP, while AGB is not. Another procedure also available, but used less commonly and not yet being done in British Columbia's is the biliopancreatic diversion with a duodenal switch (BPD-DS).

Adjustable gastric banding

Adjustable gastric banding is not covered by MSP and has largely been abandoned by bariatric surgeons in Canada. We include it primarily because many medical tourism patients have this procedure done abroad. AGB is a restrictive procedure that partitions the stomach to create a small gastric pouch that empties slowly to prolong satiety. An inflatable silicon gastric band is placed around the proximal part of the stomach and adjusted gradually by accessing a subcutaneous port. AGB-induced weight loss is slow and steady over 1 to 2 years, and typically averages between 22 and 27 kg. At the ideal restriction, the patient should lose between 0.5 and 1.0 kg per week without any vomiting.[5-7] Some patients cannot tolerate the optimal restriction without nausea and vomiting, which can also be an indication of complications or lifestyle/nutritional struggles. Complications and failure to sustain weight loss may lead to removal of the band. The removal rate can be up to 4% per year, and at 15 years almost half of all gastric bands have been removed.[8] AGB is the least common of the procedures currently performed in Canada.

Vertical sleeve gastrectomy

The vertical sleeve gastrectomy was initially introduced as the first stage in the two-stage process for biliopancreatic diversion with duodenal switch. The VSG is now an important stand-alone procedure that involves removing a portion of the stomach to leave behind a banana-shaped gastric pouch with a capacity of between 60 and 100 mL. While VSG is primarily a restrictive procedure, there is evidence that it leads to a decrease in levels of ghrelin—a peptide hormone produced in the fundus of the stomach that has been linked with hunger control.[9] A reduction in hunger thus augments the restrictive effect of VSG, which can achieve an average excess weight loss (EWL) of between 56.3% and 62.3% at 5 years postoperatively.[10] Although further studies are needed, current reports note a 66.2% remission rate for diabetes[11] and a hypertension resolution rate that ranges from 42.0% to 88.8%.[12-15] VSG is becoming increasingly popular.

Roux-en-Y gastric bypass

Roux-en-Y gastric bypass is the most studied of all the bariatric surgeries. A gastric pouch is created and separated from the remainder of the stomach. A gastrojejunostomy is performed to connect the gastric pouch with the alimentary (Roux) limb. This alimentary limb is then anastomosed to the biliopancreatic limb at a distance ranging from 100 to 150 cm of the gastrojejunal anastomosis to form a common limb. RYGB can achieve an average EWL of between 60% and 70% and have an impact on diabetes, hypertension, dyslipidemia, and obstructive sleep apnea. In one meta-analysis, diabetes was resolved or improved in 86% of patients.[2] Although RYGB is a restrictive procedure, alterations are also seen in gut hormones such as ghrelin, incretins, and peptide YY. These key contributors to clinical efficacy are not fully understood. RYGB is currently the most common bariatric surgery performed in Canada.

Biliopancreatic diversion with a duodenal switch

Biliopancreatic diversion with a duodenal switch is a more complex, higher-risk surgery that combines both restrictive and malabsorptive components. The malabsorptive component is achieved by constructing

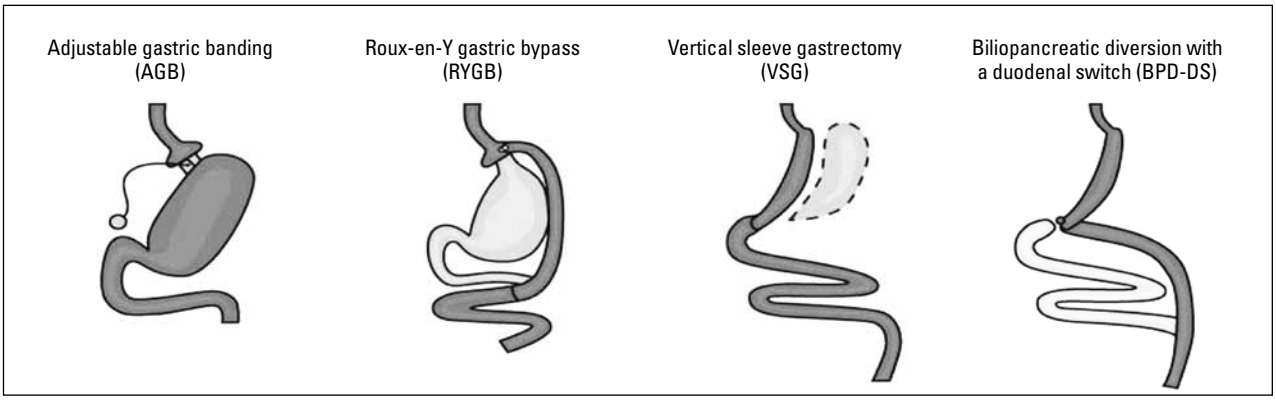

Figure. Bariatric surgical options.

Image courtesy of Walter Pories, MD (East Carolina University, Greenville, NC).

a long-limb Roux-en-Y anastomosis with a short common channel of approximately 50 cm. BPD-DS tends to be reserved for patients with "super obesity" (usually meaning a BMI greater than 50.0 kg/m^2). Although BPD-DS may be superior to RYGB in long-term weight loss, direct comparative studies have been difficult to perform.[16] Associated complications such as intestinal obstruction, nutritional deficiencies, and foul smelling stools have limited the use of BPD-DS in clinical practice and extensive long-term follow-up is needed. BPD-DS is performed at only a few centres in Canada.

Future directions

There is an urgent need to address the obesity epidemic given the significant individual and societal costs. Preventing and managing obesity requires acknowledging that it is a disease and improving access to treatment.

Therapies and initiatives for preventing obesity should be differentiated from those for managing obesity through weight loss and weight-loss maintenance because the physiology, behavioral issues, and treatment goals of each are distinct. Also, because severe obesity can begin early, prevention should focus on promoting a healthy lifestyle in the prenatal, neonatal, and early childhood years when nutritional choices can affect long-term chronic disease risk. Surgical options should be reserved for weight loss and weight-loss maintenance, and further research into the biology and psychology of weight-loss maintenance should be undertaken to develop more effective approaches. Finally, more intensive public health campaigns and training opportunities are needed to better inform providers, industry representatives, insurers, policymakers, and the general public about the health impact of obesity and the need for medical management.

Summary

Surgery has consistently proven to be the most effective long-term therapy for treating obesity. Despite excellent outcomes with current procedures, including biliopancreatic diversion with duodenal switch, vertical sleeve gastrectomy, and Roux-en-Y gastric bypass, most obese patients with obesity-related comorbidities who meet criteria for surgery do not pursue treatment. This is likely due to a combination of poor access to bariatric surgery programs and a lack of patient awareness of surgical options. A bariatric surgery program that employs a multidisciplinary approach will promote better outcomes and quality of life for patients. Efforts should be made in BC to support bariatric surgery programs that are accessible to both referring physicians and patients. BCMJ

Competing interests

None declared.

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