



Mini Review

Surgery or medical treatment for low baseline BMI patients with type 2 diabetes mellitus?

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Type 2 diabetes mellitus (T2DM) is one of the fastest growing epidemics in the world. The disease is traditionally viewed as non-curable chronic medical condition. However, accumulating evidence points that a complete remission of T2DM is feasible. Current guidelines recommend multimodal approach consisting in lifestyle management and hypoglycemic agents therapy [1]. However, less than 40% of patients achieve glycemic control [2].

Bariatric surgery is definitely indicated for severely obese patients with a body mass index (BMI) >40 kg/m² or more than 35 kg/m² with associated comorbidities. These are almost the same indications since 1991 (NIH guidelines) with few updates and modifications since that date. For patients with severe obesity, bariatric surgery leads to substantial weight loss and also to vascular and endocrine associated comorbidities improvement and remissions [3]. T2DM improve at an early time point after surgery. That seems to be independent from major weight loss [4-6]. These facts have quickly led to the establishment and the spread of the concept of metabolic surgery.

Some principles remained questionable despite all the generated knowledge and good practices. The indications for bariatric-metabolic surgery are still based on BMI-centric criteria. The BMI calculation can be misleading in daily practice. BMI calculation is only a proxy for fat-mass measurement and the correlation between BMI value and the amount of visceral fat is unclear. Chronic associated diseases in obese patients cannot be managed on only global body mass assessment basis [7].

Just a few years ago, the use of insulin was the last line for T2DM treatment. Some of the objective consequences of that was a beta-cell consumption, inefficient glycemia control, installment of chronic complications and related morbidities. Currently, the guidelines are completely different. The management is based on early diagnosis and early prescription of the most effective treatment [8].

Bariatric surgery is more effective than medical treatment for the long-term remission of T2DM in obese patients. The superiority of bariatric procedures over medical management program was supported by multiple studies that brought the grade 1a evidence for the question [9-14]. Based on the independence of glycemia long control from the weight excess loss and the absence of correlation between diabetes relapse and weight gain after surgery, demonstrating the efficacy of metabolic surgery in T2DM reversal for patients with moderate obesity (BMI 30-35 kg/m²), became interesting [15-17]. All of the bariatric procedures are effective in DM2 treatment in superobese and obese patients. The malabsorptive procedures are

more effective in achieving regression and cure of T2DM. Laparoscopic Roux-en-Y gastric bypass (LRYGBP) is comparable to min gastric bypass (MGB). Both techniques are superior than LGS regarding T2DM long-term control. From that angle, the best procedure seems to be biliopancreatic diversion (BPD). However, it has the worst metabolic deficiencies [18]. These potential long-term deficiencies such as anemia, vitamins and micronutrients loss and uncontrolled weight decrease are the controversy for metabolic surgery in uncontrolled diabetic patients with BMI<35Kg/m² [19-21]. The Laparoscopic gastric sleeve (LGS) is less effective than other techniques. The rate of metabolic complications is not considerable, and the deficiencies are always manageable [22].

The metabolic surgery related morbidity is nowadays almost nil and may offer a T2DM long remissions which can stop the microvascular spread of this disease and protect from systemic damages of the hyperglycemia [22,23]. These exciting results made the American Diabetes Association (ADA) and some other international diabetes organizations propose a BMI threshold of 30 kg/m² for considering metabolic surgery in patients with uncontrolled T2DM [24]. Several evidence-based facts from numerous randomized controlled trials support new guidelines that advocate for the consideration of metabolic surgery as one option, along with lifestyle and medical therapy, to treat T2DM among patients with a BMI <35 kg/m². However, the best surgical technique is still non-consensual. The ideal technique for diabetic non-obese patients seems to be the one that ensure an efficient control of the glycemia with only a mild weight loss that permit to avoid the other deficiencies installment. Recent procedures that replicate some of the intestinal anatomy and physiology of RYGB without compromising the stomach can exert powerful anti-diabetes effects with little or no weight loss. This is the case of single anastomosis-based procedures [25,26]. Many reports proved the efficacy and the safety of these procedures in non-obese T2DM Patients treatment. An effective durable control of the diabetes was obtained with reduction of the HB1c rates and again with no mortality and mild surgical morbidity [27-30]. The effect of the surgery on the high blood pressure and the lipid profile was less pronounced. These solid evidence-based findings are still to be worked out before the standardization.

The safety of the metabolic surgery is no more subject of discussion. The indication of an anti-diabetic procedures is justified for a selected group of patients among those with BMI<35kg/m². A simplified malabsorptive technique could ensure a T2DM remission and maybe cure with an acceptable rate of surgical morbi-mortality. The medical treatment could be stopped early after the procedures. However, we still believe in the importance of the lifestyle management to ensure the durability of the procedure results.

Key takeaways

- Several lines of evidence justify contemplating the use of bariatric operations in lower-BMI patients with uncontrolled T2DM. The BMI will remain being considered as an eligibility criterion for surgery despite its evident insufficiency. The cut point of 35kg/m² should be lowered and the indications update have to be accepted worldwide to check the results of metabolic procedures for T2DM patients with BMI<35kg/m² in different ethnic groups and different hands expertise.
- The effect of the metabolic surgeries on T2DM control is independent from the weight loss.
- Patients with baseline low BMI loose less weight after bariatric surgery than obese one. The effect of metabolic surgery on T2DM control seems to comparable for patients with BMI<35Kg/m² versus above.
- In this group of patients, the effect of the metabolic surgery on the others cardiovascular risk factors such as high blood pressure and dyslipidemia is still discussable.
- The safety of most of the malabsorptive surgeries is evident with a mortality almost nil and a neglectable morbidity. However, the rate of metabolic life-time deficiencies will push the choice to a simplified procedure which doesn't affect the weight for the low BMI patients.
- The durability of the metabolic effect of the surgery can reach 5 years. The rate of T2DM cure is considerable for low baseline BMI patients.
- Overweight and T2DM are closely related to unhealthy lifestyle. the pharmaceutical interventions can be stopped early after a selected metabolic procedure. However, the lifestyle management should always follow.

Conflict of interest: none

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