

Bariatric/metabolic surgery for diabesity..!

Editorial

The escalating pandemic of obesity and ultimately diabetes (Diabesity) is recognized as one of the greatest global public health problem during the new century. Obesity is the primary cause for T2DM and the alarming rise in diabetes prevalence throughout the world has been in direct association increase rates of obesity worldwide moreover increasing prevalence of obesity in children indicates that problem will exist beyond our lifetime.

T2DM leads to many health problems including cardiovascular disease, stroke, retinopathy and blindness, nephropathy and renal failure, neuropathy, amputations, sexual problems, psychosocial problems, cognitive decline and mortality risk from certain forms of cancer besides shorter life expectancy by 12-14 years heralded by premature death.

T2DM has been considered a chronic and progressive disease, despite the current therapy for type 2 diabetes includes lifestyle intervention (weight-loss, appropriate diet, and exercise) and anti-diabetes medications but unfortunately lifestyle interventions are disappointing in the long term because of tremendous barriers due to modernized life. In fact, T2DM often worsens with time, requiring more numbers of medications or a higher dosage and complex regime to keep Glycemic control optimal.

The ongoing reports from higher centers that deal with several GI surgery initially designed to promote weight loss (bariatric surgery) can improve glucose homeostasis more effectively than any known pharmaceutical or behavioral approach (Metabolic Surgery). Bariatric operations currently performed include stomach restriction (adjustable gastric banding, sleeve gastrectomy) and combined restrictive and malabsorptive procedures (Roux-en-Y gastric bypass, biliopancreatic diversion). The most common bariatric surgery is gastric bypass (also called Roux-en-Y gastric bypass, RYGB): causing durable remission in majority of patients with T2D. Among many of this procedures but robust evidences have favored Roux-en-Y, Biliopancreatic duodenal diversion (duodenal switch) and to lesser extent vertical sleeve gastrectomy for better and sustained weight reduction and metabolic control. Gastric bypass patients lost an average of 25% of their body weight (and nearly 11% of their body fat), gastric band dropped 15% of their weight (and 5.6% of their body fat) and lifestyle group members lost 5.7% of their weight and 3% of their body fat. People in the gastric bypass and malabsorptive procedures have seen remarkable reduction their waist size; an indicator of visceral fat shrink.

Numbers of metabolic surgery has been growing over the past decade, enhanced by experimental evidence that GI adjusted operations similar to those in bariatric operations can directly improve Glycemic control and not merely weight reduction. In 90% cause lowering blood sugar, reducing the dosage and type of medication required, for example many patients withhold insulin's and could manage by oral medications and improving diabetes-related biochemical abnormalities, e.g. lipedema and blood pressure control. Metabolic surgery can induce remission in 78% of patients by bringing blood glucose to normal ranges and eliminating the need for medications and consequently general health and diabetes remission that lasting for years.

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Attempts to figure out the exact mechanisms by which GI surgery improves T2D have implicated changes in gut hormones, bile acid metabolism, nutrients sensing and metabolism, gut microflora, and probably other factors. On the basis of such biological and clinical evidence, the first Diabetes Surgery Summit (DSS-I), held in Rome, Italy, in 2007, recommended bariatric/metabolic surgery as a treatment for T2D, encouraging randomized clinical trials (RCTs) to compare surgery versus various medical/lifestyle interventions.

The new guidelines provide much more emphasis and guidance for general Physicians, endocrinologists, and Diabetologists about the use of metabolic surgery in the treatment of obese patients with T2D, however the knowledge of health professionals, people understanding are lacking and screening for eligible candidates is suboptimal.

Compared with previous guidelines for bariatric surgery, which used only BMI as sole parameter to select surgical candidates, the DSS-II recommendations introduce the use of diabetes-related parameters to help identify clinical paradigms where surgical treatment of T2D should be one of the preferred options. In addition to helping clinicians for selection of surgical candidates, the recommendations from DSS-II also elucidate the preoperative workup and postoperative follow-up of patients undergoing metabolic surgery for T2D.

Recent reports (published in Diabetes Care June 2016) have highlighted some of the mechanisms that might be responsible for improvement in post-prandial glucose excursions. Holst et al. discuss the intrinsic factors along with the metabolic, endocrine, and neural signals generated by the gut or associated with vagal activity to influence secretion of gut hormones that modulate postprandial glucose excursions (i.e., incretins).

Batterham and Cummings, provided evidence to demonstrate that Roux-en-Y gastric bypass and vertical sleeve gastrectomy increase circulating levels of glucagon-like peptide 1, bile acids, and fibroblast growth factor 19, while also altering intestinal nutrient sensing, absorption, and metabolism, and the gut microbiota.

Before we can distinguish the role of metabolic surgery, variable treatment algorithm and expansion of candidates' pool, we need to understand the efficacy, complications, long-term clinical outcomes, and costs. There is a shortage of long-term outcomes data from RCTs

relating to diabetes and diabetes-related complications. Published reports on such outcomes are currently limited to observational studies and non RCTs and only short term (up to 5 years) regarding the impact of these procedures, compared to medical coupled with life style interventions for Glycemic and weight control.

25 years back by National Institutes of Health recommendations that suggested these operations be restricted to individuals with $BMI \geq 35 \text{ kg/m}^2$. Now many voices and arguments are demanding more expanding the use of metabolic surgery to populations that have traditionally not been considered candidates according to older recommendations. Because bariatric procedures markedly improve T2D and promote remission in part through weight-independent mechanisms, appropriate candidates for metabolic surgery might include individuals with T2D and $BMI < 35 \text{ kg/m}^2$, patients of T2DM with a BMI as low as 30 kg/m^2 , or as low as 27.5 kg/m^2 for Asian populations. Other populations for whom bariatric/metabolic surgery has been proposed also include adolescents with T2D and obese patients with T1D.

Shah et al reported metabolic surgery might be considered for adolescents with T2D, due to evidence for the efficacy and benefits showed in adult subjects with T2D. Kirwan et al. reported bariatric surgery was performed in individuals with T1D and severe obesity. Short-term results of bariatric surgery in patients with T1D are encouraging regarding insulin requirements and weight loss. Despite increasing recognition of the efficacy, safety, and cost-effectiveness of metabolic surgery, significant barriers to appropriate use of surgical procedures still prevent more surgery to be done for those who need it.

Where studies have concluded that metabolic surgery has been likely cost-effective for people with T2D, but still costs of metabolic surgery were recognized as representing a challenge to limited health care budgets even in countries like US and UK, however these costs must be carefully weighed against the current and future costs of T2D's burden.

Conclusion

In addition to behavioral and medical treatments, bariatric surgeries constitute a powerful option to ameliorate diabetes in patients affected by severe obesity.

A substantial body of evidence has accumulated, including nume-

rous, RTCs (mostly short/midterm), showing that metabolic surgery can achieve excellent Glycemic control and reduce cardiovascular risk factors. They generally result in greater and sustained weight loss than conventional treatment, and leads to improvements in quality of life and obesity related diseases such as diabetes, hypertension, and sleep apnea.

Metabolic surgery is an appropriate treatment for people with T2DM and obesity not achieving optimal treatment targets with medical therapies, T2D with ($BMI \geq 40 \text{ kg/m}^2$), regardless of the level of Glycemic control or complexity of glucose-lowering regimens, as well as in patients with ($BMI 35.0-39.9 \text{ kg/m}^2$) with inadequate Glycemic control despite lifestyle and optimal medical therapy. T2D in patients with ($BMI 30.0-34.9 \text{ kg/m}^2$) and inadequate Glycemic control, despite optimal medical treatment by either oral or injectable medications.

Metabolic surgery should be performed in specialized centers with multidisciplinary team of Physicians, Nurses, Psychologists and dietitians that understand the management of diabetes and bariatric surgery and having the experience in handling postoperative nutrition control, rehabilitation and complications.

The most common complications from gastric bypass include gastrointestinal leak, pulmonary embolism, bowel obstruction and internal hernia and from the gastric banding procedure; include slippage or erosion of the band, esophageal dilatation and breakage of the device. Considering the risk-to-benefits ratio, bariatric surgery is extremely effective when compared to medical treatment and life style modifications, moreover the risk of death from diabetic complications is greater than the risk of death from surgery.

Metabolic surgery is a potentially cost-effective treatment option in obese patients with T2D. The clinical professionals should work together with health decision makers to appreciate metabolic surgery as an appropriate intervention for this group of patients and to get over obstacles especially the financial ones.

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Conflicts of interest

The author declares there is no conflicts of interest.