

Case Report

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Remission of Type 2 Diabetes in an Adolescent Undergoing Bariatric Surgery



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Abstract

The prevalence of overweight and obesity in Mexican children and adults has increased in the last three decades and this has caused that, currently, Mexico is one of the two countries with the highest prevalence of obesity in the world. The national health and nutrition survey establishes that in 2016 the prevalence of overweight in the group of schoolchildren was 17.9% and that of obesity 15.3% [1]. In the adolescent population, the combined prevalence of overweight and obesity was 36.3%, which causes a risk of presenting associated comorbidities [2].

Morbid obesity is defined as patients with a BMI > 40kg/m², patients with this type of obesity will have a higher risk of diabetes, hypertension, dyslipidemia and cardiovascular disease, studies have shown that a decrease in weight of 5-10%, cause improvement in metabolic profile with possible resolution of diabetes. Bariatric surgery has been shown to achieve 56% loss of body weight, 62% resolution of hypertension, improvement of dyslipidemia in 70%, and resolution of type 2 diabetes in 57% of patients with morbid obesity and associated comorbidities [3-5].

Next, we present the case of an adolescent with morbid obesity, treated at the morbid obesity clinic of the Hospital Infantil de México Federico Gómez, who after undergoing gastric bypass presents a reduction of 22% in his initial weight and resolution of the diagnosis of diabetes type 2 mellitus by biochemical and clinical parameters.

Keywords: Overweight and obesity; Nutrition; Adolescent population; Diabetes; Hypertension; Dyslipidemia; Cardiovascular disease; Body weight; Hypertension

Case Report

Male patient who is known in our institution at the age of 16 years, with onset of moderate diabetic ketoacidosis, due to probable type 2 diabetes mellitus, with the presence of morbid obesity with a weight of 120Kg (> p90), BMI 40Kg/m² (> p90). With a significant history of a mother diagnosed with type 2 diabetes mellitus and a father with obesity and hypertension. On physical examination, a patient with clinical data of insulin resistance with acanthosis nigricans (III) in the neck, armpits, and groin, as well as central obesity with the presence of stretch marks. On admission, management is started with rapid insulin infusion at 0.1UI/kg/hr, a patient who requires orotracheal intubation, use of amines due to a delicate hemodynamic state, requires insulin infusion for 4 days, due to the insulin resistance that he presented, treatment with metformin 425 mg/every 8hrs was started, as was hydrochlorothiazide plus losartan due to the presence of hypertension. In outpatient follow-up, he presented HbA1C 6.3%, total cholesterol 173mg/dl, triglycerides 297mg/dl, HDL 33mg/

dl, LDL 80mg/dl, peptide C 0.42, abdominal circumference 116cm (> p90), BMI 41.9kg/m². At 9 months after diagnosis, a patient with poor adherence to treatment and diet, with a weight gain of 132kg, height 174 cm, CA 131cm, but with glucose in range, so it was decided to suspend treatment with insulin and start liraglutide (GLP-1) 1.2mg, to improve food cravings. In July 2015, a gastric sleeve was performed for weight reduction.

At 3 postoperative months, the patient presented a decrease of 20kg, with a weight at that time of 111.8kg, BMI 36.5kg/m², HbA1C 5.3% and peptide C of 2.92ng/ml, in 2017, 2 years after the surgery was performed Laparoscopic cholecystectomy due to chronic lithiasic cholelithiasis. Patient is evaluated at 6 years post gastric mandate, with a weight of 102kg, height of 1.72cm, BMI 33.8kg/m², CA 113cm, with basal insulin of 11.2μUI/ml, basal glucose 89mg/dl, total cholesterol 144mg/dl, triglycerides 105mg/dl, HDL 38mg/dl, LDL 85mg/dl, HOMA 2.4 and HbA1c 5.3%, USG Hepatic with no evidence of fatty liver.

Discussion

Obesity in Mexico affects 15.3% of the population in school and 36.3% adolescents, which puts them at risk of presenting associated comorbidities such as type 2 diabetes mellitus, hypertension, dyslipidemia, and cardiovascular disease. Despite having multiple drugs for the control of type 2 diabetes, only 10% of patients achieve target glycosylated hemoglobin (HbA1c) [2].

The introduction of bariatric surgery as a treatment in patients with morbid obesity has led to a 56% reduction in body weight, 62% resolution of hypertension, improvement in dyslipidemia in 70% and resolution of type 2 diabetes in 57%, has led bariatric surgeons and endocrinologists to think that bariatric surgery is an adequate treatment in those patients with a BMI > 35kg/m² and diabetes mellitus.

Bariatric surgery allows to improve the patient's body weight and thereby improve insulin resistance, the presence of dyslipidemia and hypertension, thus improving their quality of life and increasing the risk of mortality secondary to this disease, since it is difficult to achieve an HbA1c <7, an adequate control of dyslipidemia with drugs since many of them to achieve these objectives cause weight gain or have a higher risk of hypoglycemia (sulfonylureas, insulin meglitinides). In addition, it can be associated that only 15% of patients living with obesity present an improvement in their body weight through changes in lifestyle and pharmacological treatment, which it is associated that these changes will not last for life. which puts them again at risk of metabolic alterations, which is why it has led specialists in the search for other treatments that better impact the loss of body weight and thereby improve the metabolic profile of patients.

Bariatric surgery was proposed as a treatment method in patients with morbid obesity and a BMI > 40Kg/m² or patients with BMI > 35Kg/m² and associated comorbidities. A meta-analysis carried out in 2016 in which 621 studies were included, showed that patients submitted to this treatment had a loss of up to 55% of their body weight before surgery, then a decrease in dyslipidemia of 70%, resolution of hypertension in 61.7% and obstructive sleep apnea in 85% of patients [3].

Bariatric surgery can lead to the resolution of type 2 diabetes from 57% to 95% depending on the technique used, in addition to demonstrated benefits in patients diagnosed with carbohydrate intolerance, preventing its progression to diabetes. The mechanisms by which bariatric surgery contributes to the remission of diabetes are considered to be several, and not only the reduction of weight, since an improvement in the glycemic ranges has been seen, in the first days after the surgery, much before weight loss, since surgery causes effects on the secretion of incretins (GLP-1), the hypothesis of the small intestine establishes that there is a reduction in the absorption of nutrients in this region of the intestine and the hypothesis of the intestine coarse compromises ghrelin secretion and improves insulin sensitivity

at the liver level due to energy restriction and subsequently improves peripheral insulin sensitivity secondary to weight loss. Other mechanisms such as changes in the eating pattern, food absorption, and gastric emptying may also be associated with the clinical and metabolic improvement of insulin resistance [2,3].

A study carried out at the Center for Obesity and Digestive Surgery in Mumbai, India, determined that the good prognosis criteria for the resolution of type 2 diabetes in patients undergoing bariatric surgery are: an initial C peptide > 3, duration DM2 <5years, a BMI > 40kg/m² and not being on preoperative insulin treatment, the patient in the case that we present to you met the criteria of good prognosis such as duration of the disease <5 years, a BMI > 40kg/m², was not on insulin treatment prior to surgery, so these could have indicated that he could present resolution of DM2 after the procedure [1].

The follow-up of these patients should be carried out with weight loss control and biochemical studies, since it has been evaluated in several studies that through these, we can establish the moment in which our patient presents resolution of diabetes. The metabolic criteria used to indicate that we are dealing with a patient who presents a resolution of type 2 diabetes are the ADA criteria, presenting after bariatric surgery a fasting glucose <5.6mmol (126mg/dl), HbA1c <5.7%, CTOG 120 <7.9mmol/L (200mg/dl), of which our patient had an HbA1c <5.6 (5.3% 6 years after surgery).

Conclusion

In view of the growing pandemic of type 2 diabetes that we are facing in Mexico and other parts of Latin America, bariatric surgery indicates to be a therapeutic option for those patients with a BMI > 35Kg/m² and associated comorbidities, as demonstrated in our study with an adolescent patient, who after the procedure presented a decrease in weight of 22% and an improvement when presenting an elevation of peptide C to 2.92 (initial 0.42) and an HbA1C of 5.3%..

References

1. Bhasker AG, Remedios C (2014) Predictors of Remission of T2DM and Metabolic Effects after Laparoscopic Roux-en-y Gastric Bypass in Obese Indian Diabetics — a 5-Year Study. 25(7): 1191-1197.
2. Buchwald H, Avidor Y, Braunwald E, Michael D Jensen, Walter Pories, et al. (2004) Bariatric surgery: a systematic review and meta-analysis. JAMA 292(14): 1724-1737.
3. Colquitt JL, Picot J, Loveman E, Clegg AJ (2009) Surgery for obesity. Cochrane Database Syst Rev CD003641.
4. Harpe RD La (2019) Weight Loss Directly Influences Intermediate-Term Remission of Diabetes Mellitus After Bariatric Surgery: A Retrospective Case-Control Study. Obes Surg 30(4): 1332-1338.
5. Steven S, Carey PE, Small PK, Taylor R (2014) Reversal of Type 2 diabetes after bariatric surgery is determined by the degree of achieved weight loss in both short- and long-duration diabetes. Diabet Med 32(1): 47-53.



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