

Bariatric surgery in type 1 diabetes[☆]

Cirugía bariátrica en el paciente con DM 1

While the benefits of bariatric surgery in type 2 diabetes mellitus (T2DM) are widely shown, few data are available for patients with type 1 diabetes mellitus (T1DM). In addition, the increasing prevalence of obesity may result in an increased frequency of patients with T1DM and morbid obesity, and it is therefore interesting to have data about the effects of bariatric surgery in this patient group.

We report the case of a 43-year-old female patient diagnosed with T1DM in 1985 after experiencing diabetic ketoacidosis and monitored at our department since 1992, when she was referred for chronic poor metabolic control and obesity. The patient reported progressive weight increase for no identifiable cause which had led to gradual insulin dose adjustment, which had not resulted in improved metabolic control. She was receiving NPH (17-0-16) and regular insulin (12-17-11) at that time. The patient weighed 96.4 kg, and had a body mass index (BMI) of 34.5 kg/m². In 1995, treatment was switched to premixed insulin (regular/NPH 30/70) in two doses plus regular insulin at midday. From 1995 to 1998, HbA1c values ranged from 7.9% to 9.4%, and weight from 90 to 93 kg. During follow-up, microalbuminuria levels higher than 30 mg/24 h were intermittently detected, and control eye fundus examinations were performed with normal results. In 1998, treatment was started with ramipril 10 mg/day in the evening due to persistent positive albuminuria. In 2001, the patient attended our department again and was found to have a weight of 108 kg and an HbA1c level of 9.9%. Treatment was started with insulin analogues (biphasic aspart 30/70) in three doses.

She was appointed for a subsequent visit, but did not return until March 2005, when she was referred from primary care. The patient weighed 110 kg at that time, and underwent the following examination and supplemental tests: ophthalmological examination with background diabetic retinopathy, preserved tactile and vibratory sensitivity in both lower limbs, blood pressure controlled with ramipril treatment, HbA1c 9.9%, urinary albumin excretion (UAE) 142 mg/24 h, positive high-titer anti-GAD antibodies, C-reactive peptide 1.02 (NR, 0.78–1.89) with a blood glucose level of 148 mg/dL (subsequent measurements confirmed undetectable C-reactive peptide levels), total cholesterol (TC) 178 mg/dL, HDL 41 mg/dL, LDL 97 mg/dL, and triglycerides (TGs) 238 mg/dL. Treatment was started with basal-bolus therapy (glargine 0-30-0 and aspart 8-8-8, with progressive increase in insulin dose to glargine 0-80-0 and aspart 10-12-10). After these measures, the patient maintained a stable weight of 110 kg, and showed a marked improvement in her metabolic control (HbA1c, 7%). By July 2007, however, her weight had increased to 117 kg (BMI 41.9 kg/m²), which was associated with impaired metabolic control (HbA1c, 8.5%). Bariatric surgery was proposed and was initially refused by the patient, but one year later she

agreed because of persistent hyperglycemia (HbA1c, 8.5% and 9%) and weight increase (120 kg).

In June 2009, when the patient weighed 121 kg, bariatric surgery (Roux-en-Y gastric bypass) was performed. A significant reduction in insulin dose was required during follow-up. Three months after surgery, metabolic control had improved (HbA1c, 7.1%) despite a reduction in insulin dose (glargine 0-14-0 and aspart 5-5-0). Treatment was started with oral iron, vitamin D, and a multivitamin preparation.

By April 2010, her weight was stable at 80 kg (BMI 28.7 kg/m²) and metabolic control was adequate (HbA1c, 7.2%). Monitoring laboratory tests showed UAE within the normal range (28 mg/24 h) and controlled lipid parameters with no need for drug treatment (TC 167 mg/dL, HDL 42 mg/dL, LDL 91 mg/dL, TG 38 mg/dL).

It is currently recommended that metabolic control goals be individualized, based on patient characteristics and age, the course of diabetes, and the presence of chronic complications.¹ The reported patient had T1DM starting more than 10 years before and already showed diabetic retinopathy and nephropathy. However, because of her age and presumably long life expectation, control intensification was justified.

In type 2 diabetes, the benefits of bariatric surgery are clearly shown. Such benefits include mortality reduction and improvements in associated comorbidities and quality of life.² In addition, diabetes remission rates ranging from 60% to 80% have been reported depending on time since onset and patient characteristics. Because of this, surgery is currently considered as a cost-effective intervention for the treatment of T2DM. This has prompted a recent update to the recommendations of the International Diabetes Federation to the effect that bariatric surgery may be considered in patients with a BMI higher than 30 kg/m², especially if they have other comorbidities and cardiovascular risk factors.³

Few data are available in the literature about the efficacy of bariatric surgery in T1DM. In two patients with T1DM and morbid obesity, bariatric surgery was associated with a significant reduction in insulin dosage and with HbA1c decreases ranging from three to four points.⁴ A subsequent article by the same authors reporting a five-year follow-up of three patients confirmed the beneficial effects of this procedure on weight, insulin requirements, and metabolic control.⁵ Despite the limited evidence available, it appears logical to recommend this surgical procedure to patients with T1DM and morbid obesity. Further studies are required to assess more precisely the efficacy of bariatric surgery in patients with T1DM and morbid obesity, an increasingly frequent problem in the context of the higher obesity rates in the general population.

Conflicts of interest

The authors state that they have no conflicts of interest.

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Rebeca Reyes Garcia *, Manuel Romero Muñoz, Héctor Galbis Verdú

Servicio de Endocrinología, Hospital Rafael Méndez, Lorca, Murcia, Spain

*Corresponding author.

E-mail address: rebecarg@yahoo.com

(R. Reyes Garcia).