



Editorial

Why Is Diabetes Operated on? Metabolic Surgery Introduced in the Therapeutic Algorithm of Type 2 Diabetes[☆]

¿Por qué se opera la diabetes? La cirugía metabólica introducida en el algoritmo terapéutico de la diabetes tipo 2

The beneficial effects of gastrointestinal bypass surgery on diabetes mellitus type II (DM2) were first reported by surgeons in the 1950s, but it has taken more than 60 years for this discovery to emerge and be accepted by endocrinologists. In 1987, Pories published a series of diabetic patients who underwent gastric bypass procedures (GBP) in whom glycemia normalized in 83% of the cases. After following-up these patients for 15 years, Pories published the manuscript “Who would have thought it? An operation proves to be the most effective therapy for adult-onset diabetes mellitus”.¹ No therapy had ever achieved such long-lasting, complete results. In addition, in the group of patients that had been operated on, only 1% died annually, while the mortality in non-operated patients reached 4.5%. These findings led him to affirm that diabetes is not a chronic disease without effective treatment and, as a consequence, patients should be operated on as soon as possible. Similar results were obtained by surgeons from all over the world, attributing the remission of diabetes to the weight loss. Nonetheless, the evolution of the blood sugar results intrigued the scientists because the resolution of the DM2 occurred very early on, much before any substantial weight loss. Hickey proposed his hypotheses about the role of the bowel in this phenomenon based on such early glycemic control. In 1998, Hickey published an article titled “A new paradigm for type 2 diabetes mellitus: could it be a disease of the foregut?”.² In his study, he compared the results of several parameters implicated in DM2 among patients treated with GBP and a control group of non-operated patients. In all the cases, the results were better for those treated surgically and, what was more interesting and enigmatic was the early response: the majority of the control of DM2 occurred before hardly any weight loss was achieved. Therefore, the weight loss did not completely explain the glycemic control. For Hickey, there are 2 possible mechanisms: first is the reduced

intake, and second is the exclusion of the antrum, duodenum and beginning of the jejunum, where he suspected the existence of unclarified endocrine activity. Once this line of research had begun, multiple scientific publications ensued that demonstrated the remission of DM2 in obese patients who had been treated surgically. In 1999, Sjöström³ published the results from the prestigious *Swedish obese subjects* (SOS) study, demonstrating that obesity surgery is superior to medical treatment for the control of DM2, hypertension and dyslipidemia in obese patients. In 2003, a review of the SOS study confirmed that, after 10 years of follow-up, surgery still surpasses medical treatment.⁴ Sugarman⁵ showed permanent DM2 remission in 86% of cases seven years after surgery. Meanwhile Schauer⁶ obtained a remission of 83% and improvement in DM2 of 17% in patients with laparoscopic GBP surgery; he also stated that the response was greater in patients operated on with shorter DM2 evolution times, when the pancreas is less affected. One year before, Dixon had published a remission rate of 64%, with an improvement of 26% and 4 years without progression in patients treated with gastric bands.

In 2006, Dr. Rubino,⁷ in his work with non-obese genetically diabetic rats, confirmed once again that GBP resolved DM2 and that, when the GBP was reverted, the rats become diabetic again. The most surprising thing is that the rats were not obese; therefore, the resolution of the DM2 was not only linked to weight loss, initiating the path of the study of incretins. These ideas open the possibility of operating on non-morbidly obese adults with diabetes. In 2007, Dr. Rubino met in Rome with endocrinologists and bariatric surgeons and they concluded that, “gastrointestinal surgery can be appropriate for the treatment of DM2 in patients with body mass indices (BMI) between 30 and 35 who do not have proper control with lifestyle and medical treatment”.

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At that time, several scientific studies, both experimental and clinical, were initiated. Their published reports demonstrated the benefits of bariatric surgery on the metabolism of carbohydrates and lipids both in morbidly obese patients and in overweight patients, and the term *metabolic surgery* was introduced. Nevertheless, it was not until 2011 when a non-surgical scientific society (the International Diabetes Federation) concurred that DM2 surgery is effective, cheaper than medical treatment and should be considered a treatment option,⁸ especially when taking into account the fact that it reduces cardiovascular events and death.⁹

In Spain, surgeons from the Spanish Society for Obesity Surgery (*Sociedad Española de Cirugía de la Obesidad [SECO]*) and the Spanish Association of Surgeons with specialists from Internal Medicine and Endocrinology have made great efforts to communicate the scientific information. This has motivated a consensus between several scientific societies based on the scientific evidence, which has led to the publication of a common document dealing with metabolic surgery. This document, signed in 2013 by the Spanish Society of Endocrinology and Nutrition (*Sociedad Española de Endocrinología y Nutrición [SEEN]*), the Spanish Society for the Study of Obesity (*Sociedad Española para el Estudio de la Obesidad [SEEDO]*), the Spanish Society for Diabetes (*Sociedad Española de Diabetes [SED]*) as well as SECO, includes this surgery in the therapeutic algorithm of patients with DM2 and a BMI over 30. In the group with BMI 30-35, the indication should follow certain requirements (detailed in the position statement attached to this editorial).¹⁰ This opens a very promising field in surgery, in terms of both the large number of patients who can benefit from our interventions and the numerous interesting lines of medical and surgical research that will need to be developed in the near future.

Appendix A. Supplementary data

Supplementary material associated with this article can be found in the online version available at [doi:10.1016/j.ciresp.2014.02.006](https://doi.org/10.1016/j.ciresp.2014.02.006).

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