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Artículo Original

Seguimiento a nueve años de la primera Cirugía Laparoscópica de la Obesidad en Niños y Adolescentes (CLONA) en España

Nine years follow up of the 1st Adolescent Bariatric Surgery in Spain

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Resumen: Se realiza una actualización de la primera gastrectomía vertical laparoscópica (GVL) realizada en España en un niño de 10 años con IMC-42. Nueve años después de la cirugía presenta un IMC-25 y su porcentaje perdido del exceso de índice de masa corporal esperable (PPEIMCE) es un 120%, mucho mejor de lo previsto.

Palabras clave: Obesidad infantil, Cirugía bariátrica en niños y adolescentes, Gastrectomía vertical laparoscópica.

Abstract: This is an update of the 1st Adolescents Bariatric Surgery (ABS) done in Spain for a 10-year-old boy with BMI-42 Kg/m2. A Sleeve-forming Laparoscopic Gastrectomy (SFLG) was performed. Nine years later, his BMI is 25 and his Expected % BMI loss (E-%EBMIL) is 127%, better than expected.

Keywords: Children obesity; Children bariatric surgery; Sleeve-forming gastrectomy.

Introduction

In the last decades incidence of obesity has grown in children and adolescents becoming an epidemic health issue.

Important comorbidities such as Chronic Obstructive Pulmonary Disease (COPD), diabetes, high blood pressure, hypertrophic cardiomyopathy, non-alcoholic fatty liver disease, psychological problems and osseous abnormalities are directly associated with morbid obesity with great social and economic impacts in health systems.

Adolescent Bariatric Surgery (ABS) is a new concept of bariatric surgery in full evolution. Over the past 20 years the prevalence of overweight in the US has tripled reaching more than 15% of the child and adolescent population [1].

Pediatric obesity is considered when the 95th percentile for age and gender is overcome [2]. It has also been seen that between 70-80% of children with childhood obesity will present obesity in adulthood [3].

Although dietary treatment and lifestyle changes are the basis for managing childhood obesity, ABS is becoming more important in younger patients who cannot control excess weight and comorbidities are present [4].

Conservative treatments are often ineffective, especially in the cases with severe obesity (BMI ≥40 Kg/m²).

Nowadays, bariatric surgery in children and adolescents may play an important role in the treatment of obesity, but clinical guidelines have not yet been standardized.

In 2008 we published the case of a child 143 cm (4' 7") in height and 85.3 Kg (188 lbs) of weight. The child had severe obesity (BMI-42, 99th percentile) with associated comorbidities that hindered his quality of life [5]. Now, we present the follow-up of this patient 9 years after surgery.

Clinical Case

A 10-year-old boy, BMI - 42 Kg/m2, had severe Blount disease with fractures of both knees (tibia vara) due to obesity (Fig.3). He needed a wheelchair.

Both parents suffered morbid obesity. His mother BMI-64 (Fig.1) used a wheelchair and had and open duodenal switch (ODS) surgery in 2002.

Fig.1 BMI-64 and then BMI-33 at 5 years

Two years later, his father with BMI-46 had a ODS in 2004.

Fig 2. BMI-46 and then BMI-29

In March 2007, after the evaluation of all the cognitive aspects and the consent of the patient and his family, surgical intervention was decided. A Sleeve-forming laparoscopic vertical gastrectomy (SFVG) was performed with a 36F probe, with antral resection starting at the pylorus and lesser omentum patch to prevent rotation of the sleeve. Surgery and the postoperative course were uneventful. At that time he was the 1st child to have this surgery in Spain and one of the earliest and youngest published cases undergoing ABS.

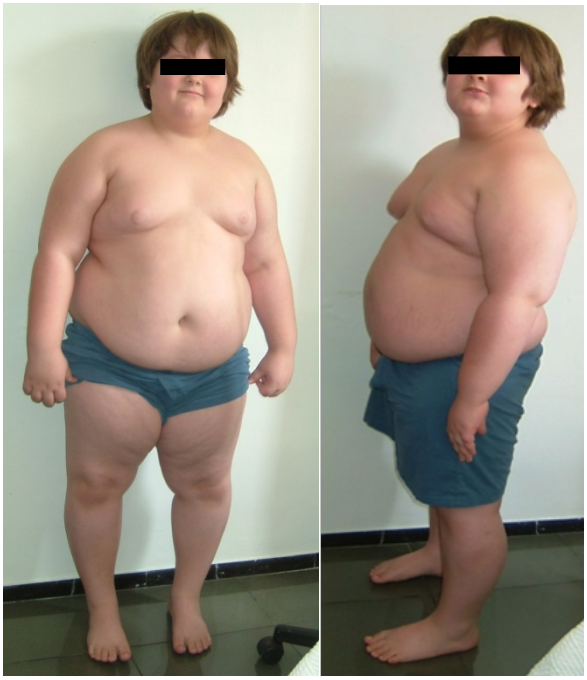

Fig.3. IMC-42 pre-op

Results

In the short term, his BMI dropped from 42 to 27 in the first 9 months and the Excess % of BMI lost (%EBMIL) was 79%. Subsequently, Blount disease correction surgery was performed on both knees with good results.

Currently he is 19 years old, with a BMI 25, and 1.57 m of height and 62 kg. He has gained 10 cm in height (Fig.4). Nowadays, the patient has an excellent quality of life and is performing normal physical activity. The %EWL is 83%, %EBMIL-100% and the Expected % BMI lost (E-%EMIL) is 120% , much better than expected [6, 7]. The Expected BMI (EBMI) for this patient based on his initial weight would be 27.76. In this case it raised the expectation with a current BMI of 25 (EPBMIL 120%).

BMI-25; %EBMIL-100%; E-%EBMIL- 120%

Discussion

Bariatric surgery in adults is usually performed in patients with BMI ≥ 40 and with ≥ 35 Kg/m² with associated comorbidities. However, in children and adolescents surgery has been more conservative: they had to present at least BMI ≥ 40 Kg/m2 with associated obesity related comorbidities that could improve with weight loss (like type 2 diabetes mellitus, pseudotumor cerebri, obstructive sleep apnea, fatty liver disease) or BMI ≥ 50 Kg/m² with or without comorbidities [8].

Last recommendations, based on experts' opinion with a retrospective evaluation tend to suggest BMI ≥ 35 Kg/m² with severe comorbidities and short-term health effects, or BMI ≥ 40 Kg/m2 with minor comorbidities [9].

These are the same limits as those used in adults; however, the margins are actually more conservative. Limits correspond to a higher BMI or Z-score percentile in children compared to adults. In fact, a BMI-40 represents super-obesity in young patients, particularly those under 16 years of age in whom these limits are substantially higher than in the 99th percentile of the growth curve [10].

According to clinical guidelines, they must achieve a pubertal development of Tanner 4-5 and at least 95% of adult height based on bone age, as well as having demonstrated psychological maturity.

In addition, a constant effort in order to lose weight with diets and physical activity must be documented.

Our patient did not get all the established requirements; however, the clinical judgment of the bariatric team finally determined the option of surgery in an individualized way [11].
Due to the fact that inclusion criteria are still lacking and there are no evidence based protocols, we think that surgical decisions with these patients should be evaluated individually.

There are several publications currently on bariatric surgery performed on children who do not meet the inclusion criteria, with good initial results. Dan et al. [12] reported the case of a 6-year-old girl with morbid obesity (BMI 53.18 Kg/m²) with associated Blount disease as described in our patient. SFLG was performed without complications and good short-term results: BMI of 33.33 Kg/m² with %EWL-37% and 50% of %EBMIL.

Mohaidly et al. [13] have published a case of a 2 and a half year old child with LSFG due to morbid obesity (BMI 41 Kg/m²) and significant comorbidities (sleep apnea and tibia vara). After surgery, short-term results were also very satisfactory, with weight reduction (BMI 24 Kg/m²) and resolution of comorbidities.

Villalonga et al. presented in his Initial Approach to Childhood Obesity [14], conducted by a multidisciplinary group of experts, that there was no agreement on variability inclusion criteria in bariatric surgery in children and adolescents.

Regarding the type of surgery, the same study suggests that there is currently no consensus. The two most prevalent options are SFLG and Roux-en-Y gastric bypass (RNGBP). Biliopancreatic diversion (BPD) is not recommended due to the greater risk of complications after surgery and the possibility of malabsorptive complications, given the short age of the patients. Although adjustable gastric band (BGA) is less invasive and with a lower complication rates, its long-term results in adult patients are poorer than in other techniques. In addition, gastric banding has not been approved by the "US Food and Drug Administration" in children under 18 years [11].

The RNGBP has good long-term weight loss results, but since it is considered a mixed technique (restrictive plus malabsorptive), there is a risk of developing metabolic and nutritional alterations that can compromise the growth of the child. In addition, they are at risk of major complications such as leakage, pulmonary thromboembolism, intestinal obstruction or internal hernias.

SFLG is the most commonly used technique at present and is still increasing. The technique is simpler, is less risky in terms of surgical and malabsorptive complications and can always be converted to a RNGBP if the surgery is not effective. However, long-term studies able to confirm their effectiveness are needed.

Conclusion

Bariatric surgery in children and adolescents with morbid obesity is an effective tool when dietary and lifestyle change measures are not helpful. Comorbidities can develope in the long term and will significantly affect the quality of life of these patients.

There is no consensus at present on what type of surgery is the most effective, although it is suggested that SFLG and RNYGBP are adequate for these patients. It has been shown that the efficacy with respect to conservative measures is greater [15], nevertheless there are still not enough studies comparing which of them are more successful in this type of patients.

It is necessary to review the inclusion criteria in the ABS since there are cases of patients who do not meet all requirements but will benefit greatly from the surgery; and above all, each case according to the BMI and the comorbidities must be individualized.

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