

Technical details of the conversion of gastric bypass to laparoscopic sleeve gastrectomy due to severe refractory reactive hypoglycemia.

Javier Martínez Caballero, Pilar Gómez Rodríguez, Elías Rodríguez Cuéllar, Lucía González González, Antonio Suárez Ramos, Eduardo Ferrero Herrero, Felipe de la Cruz Vigo

Unidad de Cirugía esófago-gástrica, bariátrica y metabólica. Servicio de Cirugía General, Digestivo y Trasplante de órganos abdominales del hospital Universitario 12 de octubre

email: j.mtnezcaballero90@gmail.com

Abstract:

Roux-en-Y gastric bypass (RYGB) may be associated to frequent complications, as reactive or postprandial hypoglycemia (PH). They usually are mild and asymptomatic, but they might become severe and refractory to medical treatment, being necessary a surgical approach. An effective alternative is the laparoscopic conversion from derivative to a restrictive technique which allows food through the duodenum. We present a 44-year-old woman, with RYGBP done in 2010 due to obesity grade III (IMC 42.9 kg/m²) with acceptable weight loss (IMC 30.25 kg/m²). She presented several severe reactive hypoglycemia, refractory to medical treatment, therefore she was treated with a laparoscopic sleeve - forming gastrectomy (SFG). Twelve months later the intensity and frequency of reactive hypoglycemia were reduced.

Keywords:

- Reactive hypoglycemia
- Dumping syndrome
- Revisional surgery
- Gastric bypass

Introduction

The Roux Y gastric bypass (BPGYR) can be associated with complications such as postprandial hypoglycemia (HP), dumping syndrome, refractory hypocalcemia, recurrent marginal ulcer, gastro-gastric fistula or gastrojejunostomy stenosis. One of the most frequent is PH, which can be difficult to diagnose with recurrent and severe episodes that limit the quality of life of patients [1]. The BPGYR is a technique that is hardly reversible to the original anatomy, especially if it is also intended to associate another bariatric technique. The majority of these patients do not want the restitution of transit through the stomach to avoid weight loss [2], but according to the theory of the proximal intestine (foregut-anti incretin), it is essential that the food passes through the duodenum and proximal ileum for reverse hypoglycemia and / or to improve symptoms related to the dumping syndrome [3,4].

In the case of PH, many of these patients do not present data on hyperinsulinism or elevation of the C-peptide. We believe that the conversion to laparoscopic sleeve gastrectomy (GV) after a BPGYR, is one of the best options to resolve or improve these metabolic complications. We describe the technique we perform to solve those situations where complications of the BPGYR occur due to preventing the passage of food through the duodenum as in severe reactive hypoglycemia, especially when it is intended to maintain or increase the excess weight loss. The patients to whom this technique would be indicated, are mainly those who present numerous episodes of severe PH with different symptoms, dumping syndrome, refractory hypocalcemia, or gastro-gastric fistula, which have a great impact on their quality of life [5]. The indication of surgery should be made after the failure of

medical-dietary treatment [6]. In this work, the technical details of the conversion of the BPGYR to the GV via laparoscopic surgery as a surgical treatment when this complication is present.

Surgical technique

The patient is placed supine French position. It is identified and dissected: gastric reservoir, gastro-jejunal anastomosis, food loop and gastric remnant. The excision of the gastrojejunal anastomosis is performed by means of a section of the reservoir between the distal segment of the gastric reservoir / gastric band (in the case of ring bypass) and the food loop (AA) by means of an endoGIA 60 mm purple Tristaple™ 3 load - 3.5-4mm (Medtronic, Minneapolis) (Image. 1). The correct release and mobilization of the gastric remnant, and the reservoir to achieve an anastomosis without tension are important. An incision is made in the distal part of the reservoir and gastrotomy in the minor curvature of the gastric remnant (Image 2a) to perform a manual-term, lateral, monoplane anastomosis with Vlock™ 3/0 suture between the reservoir and the remnant, protected with a probe 34 Fr (Image 2b and 2c). It can be done using a circular stapler. However, the use of the linear stapler can be complex because of the small reservoir.

Subsequently, after the devascularization of the larger gastric curvature from 5 cm proximally to the pylorus to the angle of His, the GV is performed on the 34 Fr probe with a 45 mm endoGIA and 60 mm Tristaple™ purple load (Figure 3). The stapling line is reinforced by suturing and epiploplasty. The tightness is checked with methylene blue. No therapeutic attitude is performed on the excluded AA that is de-functionalized. Finally, during the

reinterventions, we advise that the drainage should be left, since the surgical reviews of bariatric surgery present a higher percentage of local complications than the first interventions and a higher rate of postoperative fistulas.

Discussion

The BPGYR is often considered an irreversible technique and difficult to convert to other bariatric techniques. However, it occasionally presents complications or loss of its effectiveness as a bariatric technique that forces us to seek surgical alternatives after medical treatments fail. Among the complications presented by the challenge of modifying the surgical technique, one of the most difficult to solve is the PH. The PH occurs after the food intake in a derivative surgery and its incidence is unknown [7] although 30% of symptomatic PH is estimated. When medical treatment fails and episodes of PH continue to be severe and frequent with an impact on quality of life, surgical treatment should be considered. Although the evidence is scarce, we have proposed some algorithms for the surgical management of PH [8].

In our opinion, the most effective alternative in these cases is the conversion of a derivative technique to a restrictive one which does not prevent the passage through the duodenum. The conversion of the BPGYR to normal anatomy with or without GV involves a 76% resolution of symptoms [5]. When the weight loss has been insufficient or the patient does not wish to regain weight, a restrictive technique such as the GV should be performed as it reduces weight regain and allows conversion to a duodenal crossover in a second time [9, 10]. However, it is a complex procedure and increases the risk of fistula, for this reason, Vilallonga proposes a reconstruction similar to the GV with the plication of the remnant instead of sectioning. [11]. This plication, however, is more likely to lose long-term effectiveness, such as it happens with the endoscopic procedures, where the resection of the excess stomach occurs after the GV.

The conversion to a normal anatomy after the BPGYR, can affect gastric emptying and cause gastroesophageal reflux, diarrhea, nausea or vomiting due to the decreased gastric motility associated with a previous surgery or vagus nerve injury [12], but in general, no great alterations or complications happen, except for the weight regain. Therefore, the conversion to a GV can prevent weight regain [11].

There are several options regarding the management of the AA. The reconstruction of the traffic by sectioning the base of the handle and anastomosis of the AA is not performed systematically [13]. The handle base can be removed by joining the proximal end of the AA and the distal biliopancreatic loop (ABP) but it adds a risk of dehiscence of the anastomosis [11]. Another alternative is to resect the old one (AA) by reducing the risk of dehiscence or even by leaving it excluded, although it turns out to be more frequent to perform the reconstruction of the transit than to perform the excision of the old AA [2, 9-11]. No other publications have been found in which the AA is excluded, without resection. It has been observed that up to 40% of BPGYRs involve bacterial overgrowth [14], leaving the food loop excluded could slightly increase its incidence, but with minimal clinical relevance.

The bibliography [2, 5, 9-11, 13] on the conversion of the BPGYR to the GV is limited (table 1), being in general conversions according to non-standardized techniques and performed on demand with different objectives and resolutions. These are series of cases with a small sample, with different surgical indications, such as regaining or insufficient weight loss, marginal ulcer or PH, therefore, the pre and postoperative BMIs are not comparable, likewise, the follow-up periods are insufficient to establish strong conclusions regarding weight loss or resolution of comorbidities. The gastro-gastric anastomosis can be performed continuously (15-25% fistula) [11] with an incidence of stenosis between 0-50% [2,11,13]. It can also be performed using a 25 mm circular stapler (15% stenosis) through the larger curvature without assuming a risk of fistula in case of associating a GV [2, 5, 13] We consider that manual anastomosis allows anastomosis with an easily modifiable and adaptable size with equal security.

In 2011, Dapri published four patients with insufficient weight loss following a BPGYR, who were associated with a GV and loop base reconstruction with a percentage of overweight lost (PSP) of 59.3% and a follow-up average of 11 months [9]. In 2013, Vilallonga presented 20 patients with BPGYR conversion to normal anatomy, with or without VG related to 11.3 months of follow-up with 15% complications, all in patients with VG, and a 0% mortality without specifying the PSP [11]. Carter, in 2016, concludes that conversion to a GV is related to a resolution of complications of the BPGYR without short-term weight regain (30% PSP), but it implies more complications and readmissions [5]. In the PH, some authors recommend performing interventions on the pancreas. Mala T. states that the most frequent surgery is partial pancreatectomy and then the conversion of the BPGYR, with or without the GV [6]. 67% of partial pancreatectomies symptoms disappear initially, but up to 90% have symptoms recur after 4 years.

The extent of the pancreatectomy is controversial, reoperations due to recurrence are more frequent after 75% resection with respect to 90% of the gland [15]. Therefore, the partial pancreatectomy does not completely eliminate episodes of PH, it relates to a high comorbidity and risk of pancreatic insufficiency. We believe that it is preferable to start surgery with the BPGYR conversion and if it fails, to consider pancreatectomy. Finally, an author proposes the placement of a gastric band around the reservoir according to the Fobi technique to increase the restriction and delay gastric emptying [8].

The conversion of a derivative technique, such as the BPGYR, to a laparoscopic VG allows the improvement or resolution of the symptoms of severe PH and refractory to medical treatment in a safe way allowing to keep an adequate weight loss.

Tables and images

Author-year	Indication	Sample size	Surgery Technique	BMI pre (Kg/m ²)	BMI post (Kg/m ²)	Gastro-gastric anastomosis	Feeding Handle reconstruction	Average follow-up (months)
Carter, 2016	HP, SD, UM, GGF, EGY	12	BPGYR → GV	32,2	30	circular	No/eversion	14,7
Campos G., 2014	HP, HCR, HP +/- HCR	5	2 BPGYR → AN 3 BPGYR → GV	43	28	circular	No/eversion	12
Vilallonga R. 2013	HP, RP, SD	20	10 BPGYR → AN 10 BPGYR → AN+GV	28	26,61	circular	yes	11,5
Zurita LC., 2013	SD + PPI	2	BPGYR → AN+GV	17,6	21,5	circular	yes	14
Parikh M., 2011	PPI	12	BPGYR → GV-CD	41	31	circular	yes	11
Dapri G., 2011	RP, PPI	4	GBPVR → AN+GV	33,2	30,3	manual	yes	11

HP: postprandial hypoglycemia, SD: dumping syndrome, UM: marginal ulcer, GGF: gastro-gastric fistula, EGY: gastro-jejunal stenosis, DGYR: gastric bypass in Roux Y, GV: vertical gastrectomy, HCR: recalcitrant hypocalcemia, AN: normal anatomy, RP: weight loss, PPI: insufficient weight loss, CD: duodenal crossing.

Table 1: Bibliographic review of the laparoscopic conversion of DGYR to GV published between 2010-2017



Image 1. Section of the gastrojejunostomy



Image 2. a) Gastrotomy of the gastric remnant b) passage of the probe through the remnant through the reservoir c) anterior face of the manual anastomosis



Image 3. Start of sleeve gastrectomy on the gastric remnant

Conflict of interests

The author declares no conflicts of interest.

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