

Reversal of Roux and Y gastric bypass preserving the restriction component to treat refractory hypoglycemia

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Abstract:

Postprandial hypoglycemia is an unusual complication of Roux and Y gastric bypass (RYGB) that commonly responds to dietary changes or medication. However, there is a small group, refractory to these measures, that requires a reversal of their surgery. We present the case of a 52-year-old man with a history of RYGB who consulted for neuroglycopenia symptoms refractory to medical treatment in which laparoscopic Reversal of RYGB preserving the restriction component was performed to resolve the hypoglycemia and prevent weight regain.

Keywords:

- Gastric bypass
- Postprandial Hypoglycemia
- Reversal Surgery

Introduction

Postprandial hypoglycemia after Roux-en-Y gastric bypass (RYGB) is a rare complication, with an incidence of 0.1-0.36% (1) that occurs after one year of surgery. It is characterized by neuroglycopenic symptoms 1-3 hours postprandial with concomitant low blood glucose (<50 mg / dL) and symptoms relieved by correction of hypoglycemia (2). Patients have normal fasting blood glucose, with a positive mixed food test (3).

The management of postprandial hypoglycemia includes nutritional, pharmacological, and surgical treatment. Most patients respond adequately to dietary measures (4). Drugs such as acarbose, diazoxide, nifedipine, and octreotide are used in cases refractory to nutritional management (5). Faced with therapeutic failure, different surgical interventions have been described, among which are: gastrectomy of the gastric remnant, conversion to gastric sleeve, reversal surgery and pancreatic resection (6). There is not consensus regarding the surgical treatment of choice (7).

We present the case of a 52-year-old man with a diagnosis of refractory postprandial hypoglycemia after RYGB, who underwent laparoscopic Reversal of RYGB preserving the restriction component by preserving the gastric pouch and the gastrojejunal anastomosis.

Case report

A 52-year-old male patient with a history of morbid obesity and type 2 diabetes, who underwent laparoscopic RYGB at another institution. Before surgery, the patient weighed 105 kg, with a BMI of 38.1. The surgical date was 06/26/2017, with continuous follow-up with the nutrition and surgery team, he arrived with a weight of 64 kg a year after surgery, having a BMI of 23.2

Clinical case and diagnostic methods:

Fourteen months after surgery, the patient consults due to tremor, agitation, sweating, blurred vision, confusion and temporal-spatial disorientation, 2-3 hours after meals, 3-4 times a week, with capillary blood glucose measurements of 26-50 mg / dl. The bariatric surgery service together with the endocrinology service evaluated the case and decided to complete the study with tomography and magnetic resonance imaging of the abdomen, without pathological findings; and mixed food test that was positive, for which they decide to start the medical treatment (Table 1).

MIXED FOOD TEST		
Post ingestion	Glucose mg / dl Insulin Ulu / ml	Glucose mg / dl Insulin Ulu / ml
60 minutes	86	48
150 minutes	55	1,55

Table 1. Mixed food test. A drop in blood glucose to 55 mg / dl with an insulin of 1.55 at 150 minutes is observed in the mixed food test table. Marking a postprandial hypoglycemia at 150 minutes

Indicated treatments:

A fractional diet rich in protein and fiber is indicated, with 15-30 grams of low glycemic carbohydrates per meal for two months without response. Due to the persistence of the symptoms, pharmacological treatment with different schemes is indicated, varying between drugs every two months due to lack of response, so the total medical treatment was 6 months.

Due to refractory hypoglycemia, it is discussed in the internal bariatric surgery service center together with endocrinology, reaching the conclusion that the best option to alleviate the symptoms is a revision of the gastric bypass leading to normal anatomy and respecting the restriction. decided with the patient and his family who accepts him. Therefore, reversal surgery of the gastric bypass is performed 28 months after the primary surgery. Before the check-up, the patient weighed 62 kg, with a body mass index (BMI) of 22.5 kg / m².

Surgery technique:

Laparoscopic surgery is performed placing 5 trocars. We begin by releasing adhesions from the previous surgery, counting 120 cm of alimentary limb, 80 cm of biliopancreatic limb channel, and 520 cm of common. The alimentary limb is sectioned 15 cm from the gastrojejunal anastomosis and the proximal sectioned alimentary limb was anastomosed to the gastric remnant (Image 1).

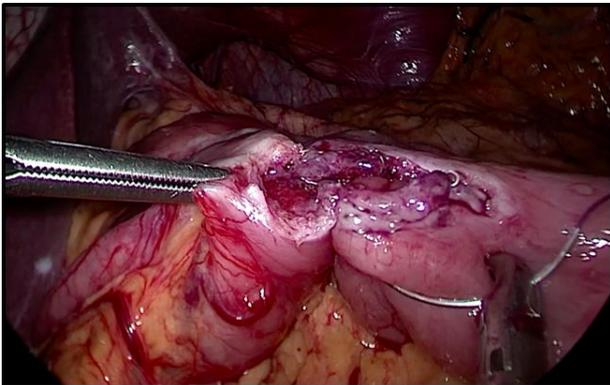


Image 1. Gastric remnant (left of the image) anastomosis with sectioned proximal alimentary limb (right of the image) using a 45-mm linear stapler with a blue cartridge (3.5 mm). The stoma was closure with running 2/0 monocryl suture.

Methylene blue test is performed without leaks. The biliopancreatic limb is sectioned 1 cm from jejuna-jejunal anastomosis with 45-mm linear stapler with a withe cartridge (2.5 mm) A new jejunal- jejunal anastomosis is performed (Image 2).

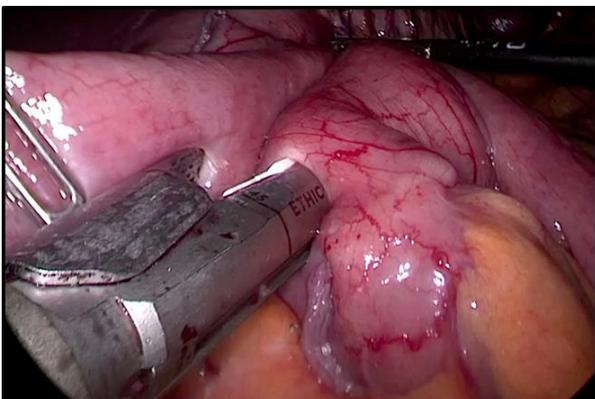


Image 2. Jejunum-jejunum anastomosis. On the left of the image you can see a clamp that holds the distal end of the alimentary limb, on the right of the image you can see proximal biliopancreatic limb sectioned 1 cm from JJ.

Anastomosis between the proximal end of the biliopancreatic limb sectioned 1 cm from JJ and the distal end of the alimentary limb was performed using a 45-mm linear stapler with a withe cartridge (2.5 mm). The stoma was closure with running 2/0 monocryl suture, leaving a small intestine length of 705 cm. Blake-type abdominal drainage is left for 24 hours. The surgical time was 120 minutes.

Post-surgery evolution:

He completed the postoperative period without intercurrents, granting him discharge from hospital 30 hours after surgery. It is indicated to continue with the same diet, gastric protection and vitamin supplements. At the third postoperative month, blood glucose normalization was confirmed, with an isolated event of postprandial hypoglycemia (findings of blood glucose 65 mg / dl) without symptoms of neuroglycopenia, and a BMI of 29.3kg / m² (re-gain of 8% of its weight prior to reversal surgery).

Discussion

The international consensus for the diagnosis and management of dumping syndrome (7) considers GLP 1 and GIP, two incretin hormones, that cause hyperinsulinemic hypoglycemia syndrome. According to the work of Yaqub (8) the insulin peak would be given by the arrival of food to the small intestine faster without the pyloric barrier and the consequent generation of the incretin peak leading to the insulin peak. Therefore, we think that the reconstruction added to a restriction to leave the previous gastrojejunal anastomosis, reduces the speed of passage necessary to reduce insulin levels after meals, generating a slower and more controlled reduction of the insulin peak.

Villalonga's study (9) included 20 patients with revision to normal anatomy after RYGB due to different complications, 9 of them due to refractory hypoglycemia, with total resolution of symptoms. In 10 patients, a reversal was performed without a restrictive component, while in the other 10 patients a gastric sleeve was associated. 3 cases of fistula were reported, all in patients with sleeve gastrectomy. In our case, we did not leak. This could be because a tension-free, wide-mouth anastomosis was performed, which would decrease the possibility of leakage.

On the other hand, Campos (10) performed the reversion to normal anatomy of 5 patients (2 with sleeve gastrectomy), with gastrostomy placement 8 to 12 weeks prior to surgery. In 4 patients, the cause was refractory hypoglycemia. After surgery, the frequency of weekly hypoglycemia decreased. Two patients gained weight while the remaining 3 decreased, however, this change was not significant. In our patient, we did not use a gastrostomy prior to surgery and the result was optimal in terms of symptomatic resolution. Likewise, in the short term the weight regain was not significant thanks to the preservation of the gastric pouch restriction and the gastrojejunal anastomosis.

According to what has been published by Caballero (11), the reversal of gastric bypass should be associated with gastric sleeve to avoid the patient's weight regain,

although the risk of complications and leak increase. We agree that we must not forget that the underlying pathology of the patient is obesity. However, we believe that associating reversal surgery with a gastric sleeve would imply subjecting the patient to a higher risk of leak and the possibility of developing gastroesophageal reflux in the future compared to the reversal technique that we propose. In our case, by associating surgery with a restrictive component, we would be providing one more tool to fight obesity and its possible comorbidities. Although our patient showed, his restriction to date is good considering the short follow-up and his BMI remains below 30 kg / m², 18 months after surgery.

Although reversal to normal anatomy is an effective technique, it is not without complications. Carter (12) performed this technique in 12 patients after gastric bypass for different causes. Two of the 12 patients in the series had postprandial hypoglycemia refractory to medical treatment. She reported an anastomotic leak, a pancreatic fistula, and an anastomotic stricture. At 30 days, 50% of the patients were readmitted, with oral intolerance being the most frequent cause. We did not find any of these complications in our case.

In 2014, Mala (6) presented a resolution of refractory hypoglycemia's symptoms by performing a pancreatic resection, but more patients resolved the symptoms by reversing the bypass with or without restriction, concluding that it was therefore a better alternative.

Likewise, Vanderveen (7) reported 48 pancreatectomies for post-gastric bypass hypoglycemia. 20 patients (37%) presented complications, 14 (20%) suffered pancreatic fistula or pseudocyst and 4 (8%) suffered reoperations. At 16 months of follow-up, 87% presented recurrence of symptoms, concluding that despite recurrence, patients reported a significant improvement in quality of life. We believe that this technique has high morbidity and poor results, so we did not adopt it.

The published series present a low number of patients and there is a lack of data on patients with long-term follow-up who have undergone RYGB reversal due to refractory hypoglycemia (1).

Conclusions

We found that the reversal of RYGB preserving the restriction component by preserving the gastric pouch and the gastrojejunal anastomosis was effective and safe for the management of hypoglycemia refractory to medical treatment in our patient. However, since there is no consensus regarding the ideal surgical treatment, we consider that its choice will depend on the experience of the treating team.

Conflict of interests

The authors declare that they have no conflict of interest.

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