Online case report

Laparoscopic diverted resleeve with ileal transposition for failed laparoscopic sleeve gastrectomy: a case report

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Abstract

Laparoscopic sleeve gastrectomy (LSG) recently gained popularity for the treatment of obesity and related co-morbidities. With the increasing number of bariatric operations, the requirement for redo or revision bariatric surgery seems to be increasing. In the present case, a 50-year-old female patient with failed LSG who underwent laparoscopic resleeve, duodenal diversion, and ileal transposition is presented. Her metabolic and biochemical parameters were found to be improved significantly after 18 months. To the best of our knowledge, this is the first report of a case treated with this method in the literature. (Surg Obes Relat Dis 2015;11:e5–e7.)

Keywords: Obesity; Diabetes mellitus; Treatment; Surgery; Laparoscopic sleeve gastrectomy; Revision; Resleeve; Duodenal diversion; Ileal transposition

Obesity has an increasing prevalence worldwide, and surgical treatment offers the highest success rates with sustainable results [1,2]. Laparoscopic sleeve gastrectomy (LSG) recently gained popularity for the treatment of obesity and related co-morbidities [3,4]. Technical feasibility and simplicity plays an important role in the trend toward LSG. On the other hand, LSG possesses some limitations. Even though the procedure itself is not a purely restrictive operation, long-term data suggests that weight regain and recurrence of co-morbidities are not rare [5,6]. With the increasing number of bariatric operations, the requirement for redo or revision bariatric surgery seems to be increasing. The 2 main reasons for revision are complications or unexpected outcomes related to initial surgery and recurrence of the initially remitted co-morbidities linked with metabolic syndrome. Revision surgery can eliminate both problems. Bariatric surgeons should choose an appropriate option for revision, in patients with a failed sleeve or those who do not attain their treatment goals with a LSG alone. In this case report, we present a patient with failed LSG who underwent laparoscopic resleeve, duodenal diversion, and ileal transposition. To the best of our knowledge, this is the first report of a case treated with this method in the literature.

Case presentation and management

A 50-year-old female patient was admitted to our clinic with weight regain and worsening of glycemic control and kidney function tests 4 years after an initial LSG operation. She had a previous history of type 2 diabetes (T2 DM) of 22 years duration and hypertension. She had undergone the LSG procedure 4 years ago at another tertiary care center. Her initial body mass index (BMI) was 37.1 kg/m\(^2\) before surgery, which was reduced to 32.7 kg/m\(^2\) 2 years after surgery. She started to regain weight within the past 2 years. At the time of admission to our clinic, her BMI was found to be 35.2 kg/m\(^2\). Her medication included premix insulin 24/18 IU (twice daily), acetylsalicylic acid (100 mg),...
acarbose (50 mg twice daily), iron supplement (ferro glycol sulphate, 225 mg daily), and diuretics (furosemide, 40 mg once daily). She was also receiving potassium lowering medication (spironolactone, 25 mg once daily). Her average blood pressure was 135/90 mm Hg, HbA1c 7.7%, total cholesterol 202 mg/dL, very low-density lipoprotein 32 mg/dL, and triglyceride 181 mg/dL. Her creatinine was 1.6 mg/dL, urea was 58 mg/dL, creatinine clearance was 51 (70–110 mg/mL/min), and parathormone was 313.2 pg/mL. Her liver function tests were within normal limits, and abdominal ultrasound showed the presence of stones within the gallbladder. She was mildly anemic (hemoglobin [Hb]: 11 g/dL, hematocrit [Htc]: 33.5%). Upper gastrointestinal endoscopy revealed a dilated stomach with a remnant fundus and erosive gastritis; bilateral retinal examination showed early diabetic retinopathy.

We decided to perform a laparoscopic resleeve with duodenal diversion, ileal interposition, and cholecystectomy. Briefly, the operation started with a trimming of the remnant fundus and antrum followed by duodenal transsection. The sleeved stomach was transferred to the lower abdomen through a retro-colic opening in the transverse mesocolon. A 170-cm segment of ileum was prepared with preservation of the last 30 cm of terminal ileum. The proximal and distal ends of ileum were anastomosed to each other. The proximal end of the ileal segment was anastomosed to the duodenal part of the sleeve, and the distal end was anastomosed to the jejunum at 50 cm from the ligament of Treitz (Fig. 1). The patient had an uncomplicated postoperative course and was discharged from the hospital 6 days after surgery. At 18 months after surgery, the patient had lost 31 kg and BMI dropped down to 23.6 kg/m². Her HbA1c was 6.2%, total cholesterol was 154.6 mg/dL, and high-density lipoprotein was 66.62 mg/dL without medication. She achieved normal blood pressure with ramipril 5 mg/d, and kidney function tests normalized. Parathormone levels dropped down to 95 pg/mL. Her vitamin B12, folate, and vitamin D levels, as well as bone mineral densitometry, were all normal. Anemia initially worsened with Hb and Htc levels reaching 7.22 g/dL and 27.1%, respectively. After iron replacement therapy, her Hb and Htc levels rose up to 9.9 g/dL and 33%. With 18 months follow up, the only problem to be pronounced is that she still needs iron replacement treatment.

Discussion

Failure after LSG is not rare, and revisional options should be sought for patients who fail to achieve treatment targets after LSG. The possible options reported include conversion to gastric bypass, minigastric bypass, or duodenal switch. This patient had an initial BMI of 37.1 kg/m², which came down to 32.7 and rose to 35.2 kg/m² 4 years after the LSG. She was not severely obese and had an HbA1c of 7.7%. The main reason for surgery was the alteration in her kidney function tests.

We did not prefer duodenal switch in this patient because of the possibility of significant malabsorption and worsening of the hematological parameters that were already deteriorated. Another option was a gastric bypass, either in the form of Roux-en-Y gastric bypass (RYGB) or minigastric bypass (MGB); however, because of the bypass of duodenum and proximal 200 cm of the jejunum, MGB would have brought an additional risk of significant iron deficiency, which the patient already suffered from. RYGB was not preferred for 2 reasons: (1) the patient presented with mild weight regain (2.5 kg/m² increase in BMI) and (2) her main concern was worsening of kidney function, not weight gain. In a patient with mild weight regain and moderate kidney failure, it is difficult to identify whether this is due to fat deposition or a volume (liquid) overload. Therefore, the expectations from the surgery were to accomplish a remission of metabolic syndrome-related co-morbidities and to obtain improvement in the kidney functions, as well as to achieve these results without causing significant malabsorption.

The metabolic outcomes of bariatric surgery are dependent on the combination of weight control and alterations in gut hormones. Bariatric surgery currently constitutes the only therapy available for obesity that results in long-term sustained weight loss with reduction in mortality and morbidity [7]. Beneficial metabolic effects can be observed in addition to long-term weight loss. Ileal transposition may act by mimicking the distal gut peptides response to an oral nutrient load, via peptide YY, glucagon-like peptide-1, and oxyntomodulin, and can be the surgery of choice in selected

Fig. 1. Illustration of resleeve operation with duodenal diversion, ileal interposition, and cholecystectomy. 1-2: Resleeve, 3: Infracolic transfer of the sleeved stomach, 4: Ileal Transposition and final configuration of the operation.
patients [8–10]. In other words, there is an important modulatory neuroendocrine aspect of the surgical intervention performed.

Diverted sleeve gastrectomy with ileal transposition (DSIT) operation has been shown to be effective for the treatment of type 2 Diabetes and other related co-morbidities. It both improves kidney function tests and offers the possibility to minimize the risk of significant malabsorption [11–13]. Another possible factor for our selection of surgical method is our clinical tendency toward DSIT. Our clinic is a dedicated Bariatric Surgery Center of Excellence, and we have been performing DSIT since 2011. Since then, > 500 patients have been operated with DSIT. In parallel to the previous data in literature [11–13], we have also observed marked improvements in the kidney function tests in patients with diabetic nephropathy and some other microvascular complications such as retinopathy. Hopefully, a good metabolic control can contribute to the regression of these microvascular events. On the other hand, we believe that control of hypertension and weight-loss-related decrease in liquid and osmotic load further supports the regression of nephropathy.

In our patient, DSIT provided remission in all components of metabolic syndrome, leading to marked weight reduction and normalization of kidney functions. It is difficult to determine whether resleeve only or resleeve with ileal transposition as a combination surgery had the main effect on the final outcome. Nonetheless, it should be noted that ileal transposition is performed in combination with sleeve gastrectomy from the beginning. The first reason for this circumstance is that ileal transposition without a sleeve will lead to gastric dilatation and intractable nausea. Second, the diverted sleeve needs to be brought through a transverse mesocolic opening to the lower abdomen to perform a safe and tension-free duodeno-ileal anastomosis; technically, this would be more challenging without a sleeve. Third, to obtain better metabolic results, it is essential to utilize the beneficial effects of sleeve gastrectomy with respect to reduced ghrelin levels and higher ileal stimuli because of increased gastric emptying [11–13].

We are aware of the fact that a single case report has a limited value from extrapolation of the message to application to larger populations. Moreover, we have a clinical preference for performing this type of surgery. Hence, authors of the present article routinely perform Ileal Transposition in selected patients with type 2 diabetes. Bariatric and Metabolic surgeons should keep ileal transposition as an effective alternative to gastric bypass or duodenal switch in patients with failed sleeve gastrectomy. Further clinical trials on larger series are warranted for clarification of the indications, the pros, and the cons of the procedure.

Conclusion

Ileal transposition with or without resleeve can be a safe, reliable, and effective option for LSG failures with acceptable nutritional side effects. Although long-term data is still pending, beneficial results with acceptable complication rates can be obtained with well-trained and dedicated teams. The technical difficulty and complexity of this operation can be overcome by well-organized education models.

Disclosures

The authors have no commercial associations that might be a conflict of interest in relation to this article.

References