



Vertical banded gastroplasty combined with Roux-en-Y gastrojejunostomy to enable effective weight loss without compromising access to stomach, duodenum and biliary tract for selected patients

Mide, duodenum ve safra yollarına erişimden ödün vermeden, seçilmiş hastalarda etkili kilo kaybını sağlayan bir yöntem: Vertikal bantlı gastroplasti – Roux-en-Y gastrojejunostomi

Tuğba Han Yılmaz¹, Hüseyin Gülay¹

Abstract

Aim: To evaluate the feasibility of vertical banded gastroplasty combined with Roux-en-Y gastric bypass as an operational gastro-gastric outlet technique with the potential to allow appropriate management of whole biliary and upper gastrointestinal tract after bariatric surgery without compromising weight loss.

Methods: This study included 24 patients (mean age: 36.8 years, range 18 to 58 years, 62.5% female) who had undergone vertical banded gastroplasty combined with Roux-en-Y gastric bypass between 2003 and 2016 in our clinic and had completed a 7-year postoperative follow up. Data on operative characteristics, length of hospital stay and follow up data on postoperative complications and weight loss were recorded for each patient.

Results: Mean operative time was 180±45 minutes while length of hospital stay was 6.0±1.0 days. There was no mortality, and only one patient (4.2%) was reoperated for hemorrhage on the first postoperative day. The most common patient complaints were early nausea and vomiting in 11 patients (45.83%), which disappeared in the second postoperative month, while 7 patients (29.2%) had dysphagia in the early postoperative period. No marginal ulcers or ulcers on anastomosis were found. Mean percentage of excess weight loss values recorded at the end of the first, second, third, fifth and seventh year following vertical banded gastroplasty combined with Roux-en-Y gastric bypass were 68.1±13.8 71.3±8.8 70.8±14.6, 68.2±11.3 and 61.4±13.3, respectively.

Conclusions: Our findings indicate the feasibility of vertical banded gastroplasty combined with Roux-en-Y gastric bypass as a bariatric surgical procedure providing better postoperative evaluation and management of the whole upper gastrointestinal system through the stomach window created with the band along with acceptable weight loss in selected patients.

Keywords: Obesity surgery; vertical banded gastroplasty; gastric bypass; endoscopic interventions

Öz

Amaç: Bu çalışmada, oluşturulan gastro-gastrik yol ile bariatrik cerrahi sonrası mide duodenum ve safra yollarının değerlendirilmesine olanak sağlayan vertikal bantlı gastroplasti ve Roux-en-Y gastrojejunostomi tekniğinin kilo kaybı üzerine etkilerinin değerlendirilmesi amaçlandı.

Yöntemler: Kliniğimizde 2003-2016 yılları arasında vertikal bantlı gastroplasti-Roux-en-Y gastrojejunostomi yapılmış ve 7 yıllık takiplerini tamamlayan toplam 24 hasta (ortalama yaş: 36.8 yıl (18 - 58 yıl), % 62.5 kadın) çalışmaya dahil edildi. Yapılan ameliyatın özellikleri, hastaların hastanede kalış süreleri, ameliyat sonrası komplikasyonlar ve kilo kaybı ile ilgili veriler kaydedildi.

Bulgular: Ortalama ameliyat süresi 180±45 dakika ve hastanede kalış süresi 6.0±1.0 gündü. Mortalite olmadı, sadece bir hasta (% 4,2) ameliyat sonrası birinci günde kanama nedeniyle tekrar ameliyat edildi. Hastaların en sık görülen şikayetleri, ameliyat sonrası ikinci ayda kaybolan erken bulantı ve kusma idi, 11 hastada (%45,83) görülmüştür. 24 hastanın 7'sinde (%29,2) operasyonun erken döneminde disfaji şikayeti vardı. Hastalarımızın takibinde gelişmiş marjinal ülser veya anastomoz ülseri tespit edilmedi. Vertikal bantlı gastroplasti-Roux En Y Gastroenterostomi yapılan hastalarımızın birinci, ikinci, üçüncü, beşinci ve yedinci yıllarının sonunda kaydedilen ortalama fazla kiloların kaybı yüzdesi sırası ile 68,1 ± 13,8, 71,3 ± 8,8, 70,8 ± 14,6, 68,2 ± 11,3 ve 61,4 ± 13,3'dür.

Sonuç: Bulgularımız üst gastrointestinal sistemin değerlendirilmesine, oluşturulan gastro-gastrik yol ile olanak sağlayan vertikal bantlı gastroplasti- Roux-en-Y gastrojejunostomi'nin kabul edilebilir düzeyde kilo kaybı sağlayarak, seçilmiş bazı hastalarda uygulanabilir bir cerrahi yöntem olduğunu ortaya koymaktadır.

Anahtar Kelimeler: Obezite cerrahisi, vertikal bantlı gastroplasti, gastrik by-pass, endoskopik girişimler

¹ Baskent University, Faculty of Medicine, Department of General Surgery, Zubeyde Hanım Uygulama ve Araştırma Merkezi, İzmir Turkey.

Ethics Committee Approval: The study was approved by the local ethical authority (94603339-604.01.02/15832/24.04.2019).

Etik Kurul Onayı: Çalışma lokal etik komite tarafından onaylanmıştır (94603339-604.01.02/15832/24.04.2019).

Conflict of Interest: No conflict of interest was declared by the authors.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Financial Disclosure: The authors declared that this study has received no financial support.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

Geliş Tarihi / Received: 25.04.2019

Kabul Tarihi / Accepted: 10.07.2019

Yayın Tarihi / Published: 01.08.2019

Sorumlu yazar / Corresponding author:

Tuğba Han Yılmaz

Adres/Address: Baskent University, Faculty of Medicine, Department of General Surgery, Zubeyde Hanım Uygulama ve Araştırma Merkezi Caher Dudayev Bulvarı, No 175 Bostanlı, Karşıyaka, İzmir, Turkey.

e-posta: tgbhnlmz135@gmail.com

Tel/Phone: 0090 5052629537

Copyright © ACEM

Introduction

Bariatric surgery is considered the only effective, sustainable treatment for obesity and obesity related comorbidities, which have become an epidemic in western populations [1, 2]. The number of bariatric operations has increased rapidly during the last few decades [1-3]. According to the International Federation for Surgical Obesity and other associations for obesity treatment, a body mass index (BMI) of ≥ 40 kg/m² or ≥ 35 kg/m² in combination with other serious medical problems is considered an absolute prerequisite for bariatric surgery candidacy [4, 5]. Although laparoscopic sleeve gastrectomy has become a more popular procedure lately, Roux-en-Y gastric bypass (RYGB) still remains one of the most effective surgeries for severe morbid obesity as it is associated with better long-term weight loss than vertical banded gastroplasty (VBG) [6].

Given the difficulties in accessing and evaluating the bypassed portion of the stomach and duodenum after RYGB, the postoperative utility of endoscopic procedures, such as sphincterotomy and gastroduodenoscopy, is limited for patients following bariatric surgery. This seems important given the expected increase in cholelithiasis and complications after bariatric surgery as well as the increasing prevalence of gastric cancer.

Therefore, a technical modification enabling access to the stomach and duodenum via X-ray or endoscopy after RYGB while not interfering with weight loss seems to offer earlier diagnosis and better management of any gastroduodenal pathologies that emerge following bariatric surgery.

In this regard, the adaption of the gastric bypass by connecting the Roux-en-Y limb to the VBG pouch, which was originally developed to improve long-term weight loss [6], could also enable endoscopic assessment of the bypassed portion of the stomach and duodenum after RYGB.

The present study was therefore designed to evaluate the feasibility of VBG combined with RYGB (VBG-RYGB) as an operational gastro-gastric outlet technique with the potential to allow appropriate management of the whole biliary and upper gastrointestinal tract after bariatric surgery without compromising weight loss.

Material and methods

Study population

Of 32 bariatric surgery patients who underwent VBG-RYGB at our tertiary care center between 2003 and 2016, 24 patients (mean age: 36.8 years, range, 18 to 58 years, 62.5% female) with 7-year follow up data were included in this study. All patients were informed about the operation, relative risks, benefits and complications.

This study was approved by the ethics committee of our institution (94603339-604.01.02/15832 and 24.04.2019). Informed consent documents were taken from all the patients. The study was performed following the Helsinki Declaration.

Study parameters

Data were recorded on patient demographics (age, gender), operative characteristics, length of hospital stay (LOS), and 7-year follow up data on postoperative complications and excess weight loss (EWL).

Surgery

All patients received antibiotic and antithrombotic prophylaxis. Subcostal incisions were used for all operations. The VBG technique was later adapted using an alimentary small bowel limb which was anastomosed to the jejunum with a Roux limb of 80-100 cm. CEEA 25 staplers, TA 90 were used for

creating the gastric pouch (Figure 1). We prepared a 5-cm-length, 1.5-cm-width band with polytetrafluoroethylene (PTFE) vascular Gore-tex graft for the gastric pouch outlet. From the 30th cm of the Treitz, the jejunum was divided and anastomosed to the anterior wall of the prepared stomach pouch with side-to-side anastomosis of 2 cm diameter (Figure 2). A hand-sewn side-to-side jejuno-jejunosomy with the biliopancreatic limb completed the RYGB and the mesenteric windows were closed afterwards.

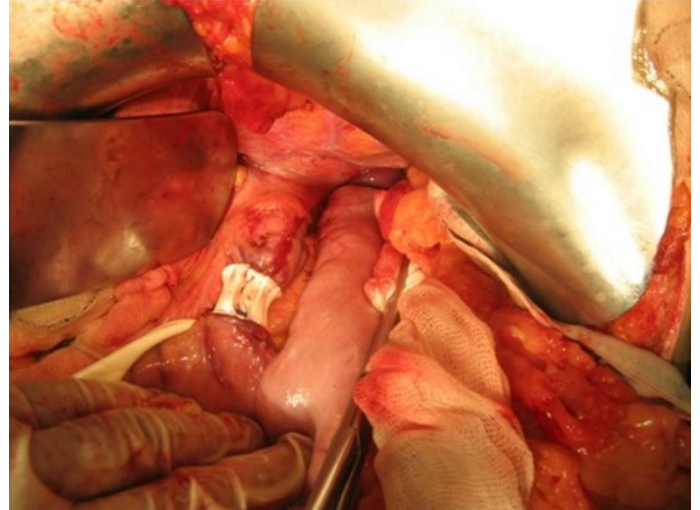


Figure 1. Vertical banded gastroplasty.

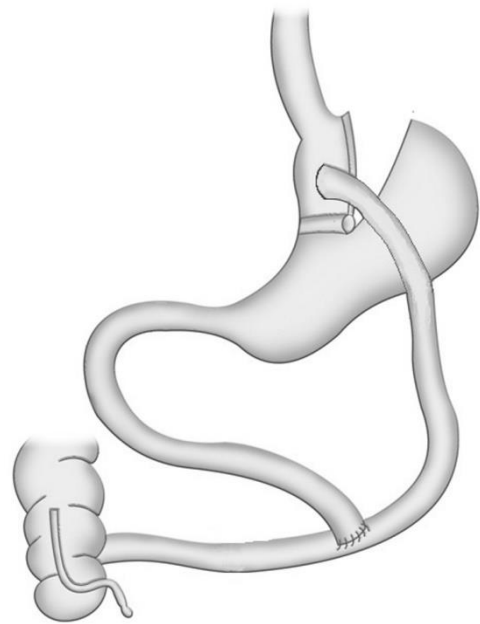


Figure 2. Vertical banded gastroplasty and Roux-en-Y gastrojejunostomy.

After VBG-RYGB, nearly all food was determined to follow the gastro-jejunosomy, with only a small amount crossing the gastro-gastric outlet restricted by the band (Figure 3).

Conversion to VBG-RYGB technique was also performed on three patients with VBG prior to study enrollment, who had dehiscenced stapler lines after operation. The omentum was placed between the divided gastric edges afterwards.

Liquid diet was started on the third day after the operation. This was gradually changed to solids over 6 weeks (clear diet: 3-4 days, semi-liquid diet: 5th day-3rd week, soft consistency solid foods: 3rd-6th week, solid foods: after 6

weeks). Follow up was programmed at 3, 6 and 12 months and then annually.

Results

Overall, the mean age of the patients was 36.8 (range 18 to 58) years while 62.5% were female patients. Preoperatively, mean body mass index (BMI) and body weight were 49.1 ± 8.9 kg/m² and 148.3 ± 38.1 kg, respectively. Three patients had had VBG operation 2.5 years before study enrollment, who had dehiscenced vertical stapler lines.

Mean operative time was 180 ± 45 minutes while LOS was 6.0 ± 1.0 days. None of the patients needed blood transfusion. There was no mortality, while only one patient was reoperated for hemorrhage on the first postoperative day. The most common complaints of the patients were early nausea and vomiting in 11 patients (45.83%), which disappeared on the second postoperative month, while 7 of the 24 patients (29.2%) had dysphagia in the early postoperative period.

Three patients (12.5%) had fat necrosis at the wound site in the early postoperative period while 2 patients (8.3%) had incisional hernia in the second year.

Mean percentage of EWL values recorded at the end of first, second, third, fifth and seventh year of VBG-RYGB were 68.1 ± 13.8 , 71.3 ± 8.8 , 70.8 ± 14.6 , 68.2 ± 11.3 and 61.4 ± 13.3 , respectively.

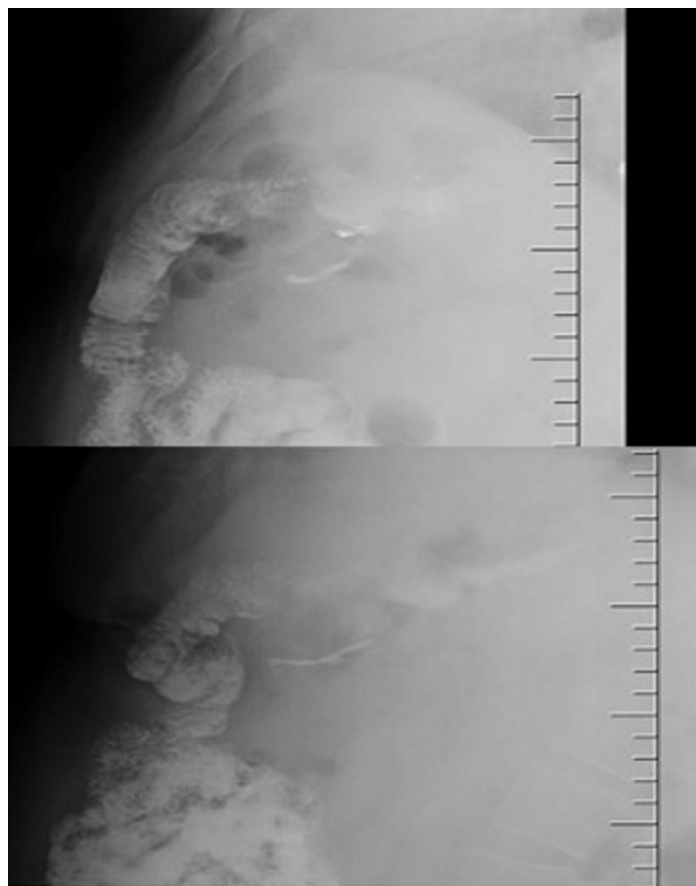


Figure 3. Contrast radiography. Only a very small amount of barium passes through the gastro-gastric outlet whereas nearly all passes through the gastro-jejunal anastomosis.

Cholecystectomy for cholelithiasis was performed in the second postoperative year in 2 patients and in the fourth postoperative year in 3 patients, while 3 patients received ursodeoxycholic acid following cholecystectomy for 5 months.

Barium x-ray assessment performed on all patients after the first year showed that only a small amount of barium in the late stage was able to pass through the gastro-gastric outlet

(Figure 3), with nearly all the barium passing through the gastrojejunal anastomosis. This condition remained unchanged for the entire 5-year follow up. The passage film of 19 patients in the 5th year were similar to that shown in Figure 3.

Endoscopy was performed in 5 patients with gastrointestinal symptoms of nausea (Figure 4) in the first postoperative year, and in 16 patients in the third postoperative year. However, no marginal ulcers or ulcers on anastomosis were found in our series.



Figure 4. Endoscopy. Gastrojejunostomy (left), gastro-gastric outlet (right).

Discussion

Weight loss is the primary aim of bariatric interventions, and most studies have focused on reducing initial excess weight or lowering BMI to quantify the effects of the operation. A bariatric intervention is considered successful when a persistent weight loss of more than 50% body weight excess is achieved [7].

With 68.1% loss of the patients' initial excess weight on the first year, 71.3% in the second year and 70.8% in the third year, the weight loss in our cohort of patients operated with VBG-RYGB, our findings seem consistent with the range for EWL (48.6 to 71.6%) reported from 54 studies involving 14,964 patients with current bariatric interventions [8, 9]. This seems also consistent with mean EWL reported specifically for 11 studies of 3,382 patients operated with VBG (58.3%) and 15 studies of 2,949 patients operated with RYGB (68.6%) [8, 9].

An earlier study assessing VBG-RGB for treating morbid obesity reported a complication rate of 0.5% and mortality rate of 0.3%, alongside mean weight loss of 58kg (range 14 to 143), percentage EWL of 77 (range 32 to 108) and mean BMI reduction to 29 kg/m² (range 20 to 43) at 5-year follow up [6].

Another study of 289 patients who underwent RYGB-on-VBG as their primary procedure reported percentage EWL of 48.2 ± 18.8 after 6 months, 59.0 ± 17.7 , 63.3 ± 13.9 , 66.9 ± 17.5 and 70.0 ± 17.7 after 1, 2, 3 and 4 years, respectively [10]. The authors noted that RYGB-on-VBG had a similar weight loss curve as standard RYGB while allowing for traditional radiography of the bypassed stomach and endoscopy of the distal stomach and biliary tract [10].

Patients with morbid obesity have a higher incidence of gallstones than the general population, with up to 50% rates reported in the literature [11, 12]. Formation of gallstones after rapid weight loss is also a well-recognized phenomenon, which RYGB patients are predisposed to during the first postoperative

year [13]. In our cohort, gallstones were managed individually by laparoscopic cholecystectomy in symptomatic patients.

The management of common bile duct (CBD) stones after RYGB is challenging given the difficulties in performing conventional endoscopic retrograde cholangiopancreatography (ERCP) for choledocholithiasis due to the exclusion of the duodenum from the gastrointestinal tract and the long anatomic route from mouth to the major papilla. The Roux limb is at least 100 cm in length. Several techniques have been proposed to treat bile duct stones in RYGB patients.

In 1998, Baron and Vickers described the creation of surgical gastrostomy to access the gastric remnant [14]. Later, a double balloon was introduced as a new endoscopic technique to allow examination of the entire small bowel [15]. In a recent report [16], percutaneous endoscopic gastrostomy with immediate self-expandable metal stent placement allowed antegrade transgastric ERCP during the same procedure. An antegrade biliary stenting following laparoscopic CBD exploration for CBD stones was also considered effective [17]. Percutaneous transhepatic cholangioscopic lithotomy has also been suggested as an alternative technique. However, these procedures require advanced technologies in large centers with considerable experience. The technique used in this study (VBG-RYGB) therefore seems significant in this regard as traditional endoscopic and x-ray study of the distal stomach remain possible along with a favorable weight loss outcome.

Hence, our findings support the data from a past study of 128 patients who underwent RYGB on VBG via an open approach, which indicated that the weight loss curve following RYGB on VBG was as effective as that for standard RYGBP, while allowing traditional x-ray and endoscopy of the bypassed stomach, and thus the biliary tract [18].

The successful outcome after VBG-RYGB in our 3 patients with prior failed VBG operation also seems consistent with consideration of RYGB on VBG having a lower rate of complications and better quality of life than VBG reoperation in patients with complicated or failed VBG [19].

Neoplasias are rather infrequent after surgery for morbid obesity. The constitutional symptoms in these patients may go unnoticed due to the association between weight loss and prior bariatric procedure.

A meta-analysis found that overweight and obesity are associated with an increased risk of gastric cancer [20], while a higher prevalence of helicobacter pylori infection is associated with an increased risk of developing gastric cancer [21]. A greater risk of developing adenocarcinomas of the esophagus and stomach was reported in obese patients with BMI ≥ 35 kg/m² than in those with BMI of 18.5 to 25 kg/m² alongside an increase in the strength of the association with increasing BMI [21, 22]. The risk for adenocarcinoma of the gastric cardia has also been associated with obesity, with relative risks in the range of 1.5-2.0 [23]. Hence, it seems important that VBG-RYGB allows easier detection of neoplastic lesions in patients who undergo surgery for morbid obesity.

The likelihood of late complications, such as hemorrhage from the excluded gastric segment or duodenum after gastric bypass, poses both diagnostic and therapeutic difficulties [24]. Diagnosis and treatment of these patients are also possible in patients who undergo VBG-RYGB, which makes it easier to perform endoscopy.

Indeed, a study of 40 patients treated with VBG-RYGB for morbid obesity reported that the use of double-balloon enteroscopy was an effective and safe means to evaluate the bypassed stomach after VBG-RYGBP. It enabled successful examination of the bypassed stomach in 87.5% of patients, with a mean time of 24.9 minutes (range 5-75 minutes) to reach the

bypassed stomach [25]. The authors suggested that long-term endoscopic surveillance is necessary after this type of surgery, based on endoscopic findings that only 25.7% of patients were normal compared to considerable rates of abnormalities, specifically erythematous/erosive gastritis (28.6%), atrophic gastritis (17.1%) and suspicious areas of intestinal metaplasia (11.4%) [25].

Our findings revealed no mortality and effective weight loss after the 7-year follow-up in patients with morbid obesity operated on with VBG-RYGB, although there were two routes from the gastric pouch: one towards the jejunum and the other towards the stomach. Hence, based on our long-term experience, we consider VBG-RYGB to be an effective operation that allows postsurgical management of the whole biliary and upper gastrointestinal tract alongside adequate control of severe obesity. This confirms data from obesity surgery centers that have adopted this technique, which reported favorable outcomes, and superior weight loss in morbid and superobese patients with a low mortality and morbidity [6, 18].

In the last 5 years, 27 laparoscopic gastric bypasses and 390 laparoscopic sleeve gastrectomies have been performed in our center. The number of VBG-RY gastroenterostomy cases is limited due to the ease and rapid applicability and good results of laparoscopic sleeve gastrectomy. However, in this period when laparoscopic surgery was preferred by both surgeons and patients, laparoscopic VBG-RY gastroenterostomy can be planned for selected patients. Our study has some limitations, it is a retrospective study, its findings should be reinforced by prospective studies designed laparoscopically and with more patients.

In conclusion, based on 7-year follow-up data, our findings indicate the efficacy and safety of VBG-RYGB in bariatric surgery for weight loss combined with low mortality and morbidity rates. In addition, this technique enables postoperative diagnostic and therapeutic endoscopic and x-ray imaging of the distal stomach, duodenum and biliary tract. Hence, our study suggests that VBG-RYGB provides a feasible bariatric surgical procedure with better postoperative evaluation and management of the whole upper gastrointestinal system through the stomach window created with the band while also enabling acceptable weight loss.

References

1. Wysoker A. The lived experience of choosing bariatric surgery to lose weight. *J Am Psychiatr Nurses Assoc.* 2005;11:26-34.
2. Buchwald H, Avidor Y, Braunwald E, Jensen MD, Pories W, Fahrenbach K, et al. Bariatric surgery: A systematic review and meta-analysis. *JAMA.* 2004;292:1724-37.
3. Altieri MS, Wright B, Peredo A, Pryor AD. Common weight loss procedures and their complications. *Am J Emerg Med.* 2018;36:475-79.
4. Blackburn G. Solutions in weight control: Lessons from gastric surgery. *Am J Clin Nutr.* 2005;82:248-52.
5. Sjostrom L, Lindroos AK, Peltonen M, Torgerson J, Bouchard C, Carlsson B, et al. Lifestyle, diabetes, and cardiovascular risk factors 10 years after bariatric surgery. *N Engl J Med.* 2004;351:2683-93.
6. Capella JF, Capella RF. An assessment of vertical banded gastroplasty-Roux-en-Y gastric bypass for the treatment of morbid obesity. *Am J Surg.* 2002;183:117-23.
7. Deitel M, Shahi B. Morbid obesity: selection of patients for surgery. *J Am Coll Nutr.* 1992;11:457-62.
8. Buchwald H. A bariatric surgery algorithm. *Obes Surg.* 2002;12:733-46.
9. Scopinaro N, Adami GF, Marinari GM, et al. Biliopancreatic diversion: two decades of experience. In Deitel M., Cowan Jr. GSM, editors, *Update: Surgery for the Morbidly Obese Patient*, Toronto, FD Communications, 2000; pp. 227-58.
10. Cariani S, Palandri P, Della Valle E, Della Valle A, Di Cosmo L, Vassallo C, et al. Italian multicenter experience of Roux-en-Y gastric bypass on vertical banded gastroplasty: four-year results of effective and safe innovative procedure enabling traditional endoscopic and

- radiographic study of bypassed stomach and biliary tract. *Surg Obes Relat Dis.* 2008;4:16-25.
11. Wattoo DA, Hall JC, Whiting MJ, Bradley B, Iannos J, Watts JM. Prevalence and treatment of gall stones after gastric bypass surgery for morbid obesity. *BMJ.* 1983;286:763.
 12. Bastouly M, Arasaki CH, Ferreira JB, Zanoto A, Borges FG, Del Grande JC. Early changes in postprandial gallbladder emptying in morbidly obese patients undergoing Roux-en-Y gastric bypass: correlation with the occurrence of biliary sludge and gallstones. *Obesity Surg.* 2009;19:22–28.
 13. Falcao M, Campos JM, Galvao Neto M. Transgastric endoscopic retrograde cholangiopancreatography for the management of biliary tract disease after Roux-en-Y gastric bypass treatment for obesity. *Obesity Surg.* 2012;22:872–76.
 14. Baron TH, Vickers SM. Surgical gastrostomy placement as access for diagnostic and therapeutic ERCP. *Gastrointest Endosc.* 1998;48:640–1.
 15. Koshitani T, Matsuda S, Takai K. Direct cholangioscopy combined with double-balloon enteroscope-assisted endoscopic retrograde cholangiopancreatography. *WJG.* 2012;18(28):3765–69.
 16. Baron TH, Song LM, Ferreira LE, Smyrk TC. Novel approach to therapeutic ERCP after long limb Roux en Y gastric bypass surgery using transgastric self-expandable metal stents: experimental outcomes and first human case study. *Gastrointest Endosc.* 2012;75:1258–63.
 17. Dario Martinez-Baena, Pablo Parra-Membrives, Daniel Diaz-Gomez, Lorente-Herce JM. Laparoscopic common bile duct exploration and antegrade biliary stenting: leaving behind the Kehr tube. *Rev Esp Enferm Dig.* 2013;105:125–30.
 18. Cariani S, Amenta E. Three-year results of Roux-en-Y gastric bypass-on-vertical banded gastroplasty: an effective and safe procedure which enables endoscopy and X-ray study of the stomach and biliary tract. *Obes Surg.* 2007;17:1312-8.
 19. Cariani S, Agostinelli L, Leuratti L, Giorgini E, Biondi P, Amenta E. Bariatric Revisionary Surgery for Failed or Complicated Vertical Banded Gastroplasty (VBG): Comparison of VBG Reoperation (re-VBG) versus Roux-en-Y Gastric Bypass-on-VBG (RYGB-on-VBG). *J Obes.* 2010;2010. pii: 206249.
 20. Yang P, Zhou Y, Chen B, Wan HW, Jia GQ, Bai HL, et al. Overweight, obesity and gastric cancer risk: Results from a meta-analysis of cohort studies. *Eur J Cancer.* 2009;45:2867-73.
 21. Erim T, Cruz-Correa MR, Szomstein S, Velis E, Rosenthal R, et al. Prevalence of *Helicobacter pylori* seropositivity among patients undergoing bariatric surgery: A preliminary study. *World J Surg.* 2008;32:2021-5.
 22. Kubo A, Corley DA. Body mass index and adenocarcinomas of the esophagus or gastric cardia: A systematic review and metaanalysis. *Cancer Epidemiol Biomarkers Prev.* 2006;15:872-8.
 23. Menendez P, Padilla D, Villarejo P, Menéndez JM, Lora D, et al. Does bariatric surgery decrease the gastric cancer risk? *Hepatogastroenterology.* 2012;59:409-12.
 24. Braley SC, Nguyen NT, Wolfe BM. Late gastrointestinal hemorrhage after gastric bypass. *Obes Surg.* 2002;12:404-7.
 25. Kuga R, Safatle-Ribeiro AV, Sakai P, Ishida RK, Faintuch J, Furuya Jr CK, et al. Usefulness of the Double-Balloon Enteroscope for Endoscopic Evaluation of the Bypassed Stomach After Vertical Banded Gastroplasty with Roux-En-Y Gastric Bypass for Morbid Obesity. *GIE.* 2006; 63:AB162. DOI: <https://doi.org/10.1016/j.gie.2006.03.327>.