

Modern Surgery**Laparoscopic Conversion of the Gastric Bypass into a Normal Anatomy****Jacques Himpens, MD; Giovanni Dapri, MD; Guy Bernard Cadière, MD, PhD***Department of Gastrointestinal and Obesity Surgery, European School of Laparoscopic Surgery, Saint-Pierre University Hospital, Brussels, Belgium*

Background: Laparoscopic Roux-en-Y gastric bypass (RYGBP) is considered as a non-reversible procedure. We report the laparoscopic conversion of RYGBP into a normal anatomy.

Methods: In June 2004, a laparoscopic RYGBP was performed in a 46-year-old female sweet-eater with BMI 46 kg/m². After 7 months, the patient reported a significant and incapacitating dumping syndrome without postprandial hypoglycemia. She requested conversion to a normal anatomy; hence, a laparoscopic RYGBP reversal was performed. The BMI at the time was 27 kg/m².

Results: Operative time was 95 minutes and intra-operative blood loss was 150 ml. The patient had an uneventful recovery and was discharged home on the 5th postoperative day. At 6 months follow-up, her BMI was 27 kg/m², and barium swallow showed good passage with good gastric motility. After 1 year, the BMI is still unchanged and she is doing well.

Conclusion: Restoration of normal anatomy after RYGBP is feasible.

Key words: Gastric bypass, Roux-en-Y, laparoscopic conversion, normal anatomy

Introduction

In 1994, Wittgrove et al¹ described the procedure of Roux-en-Y gastric bypass (RYGBP) by laparoscopy (Figure 1). Conversions of RYGBP into other bariatric procedures and vice-versa have been reported.²⁻⁸ We report the laparoscopic conversion of RYGBP into a normal anatomy, performed by one of the authors (JH).

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Method

In June 2004, a laparoscopic RYGBP was performed in a 46-year-old female sweet-eater, with a BMI of 46 kg/m². An entirely hand-sewn end-to-side gastrojejunostomy was performed. After 4 months, the gastrojejunostomy was stenotic despite endoscopic dilatations, and a new hand-sewn anastomosis and a gastrostomy were performed. After 7 months, the patient reported a significant and incapacitating dumping syndrome, without postprandial hypoglycemia. Gastroscopy was normal. The lady requested conversion to a normal anatomy. Hence, a laparoscopic RYGBP conversion was proposed to the patient. Her BMI at the time was 27 kg/m².

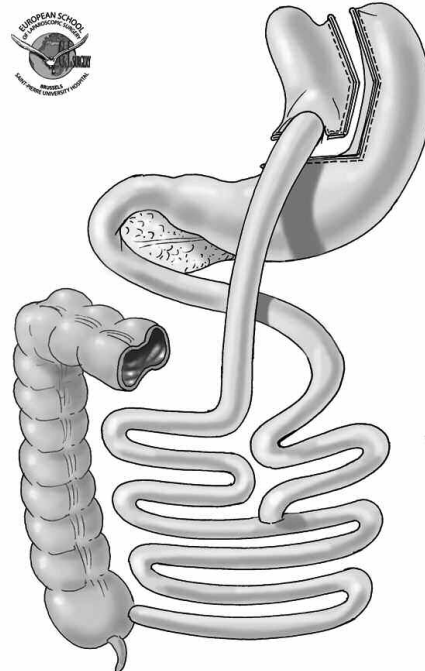


Figure 1. Roux-en-Y gastric bypass.

Laparoscopic Technique

The patient was positioned supine with the legs apart and was carefully strapped to the operating table. The surgeon stood between the patient's legs. The laparoscopic procedure started with the creation of a pneumoperitoneum by open laparoscopy 20 cm inferior to the xyphoid process. Four additional trocars were positioned as when the RYGBP had been performed: a 5-mm trocar in the left anterior axillary line 5 cm below the costal margin, a 12-mm trocar in the left upper quadrant in the mid-clavicular line and between the 1st and 2nd trocar, a 12-mm trocar in the right upper quadrant in the right mid-clavicular line, and a 5-mm trocar just distal and to the left of the xyphoid (used for liver retraction).

The procedure began with lysis of adhesions achieved by the coagulating hook, until clear identification of the gastrojejunostomy and the distal stomach was obtained (Figure 2). Then Petersen's space was opened (Figure 3). The small bowel was completely inspected in order to identify the alimentary limb, the jejunojejunostomy, the common and biliopancreatic limbs. The biliopancreatic limb was divided from the rest of the small bowel by one firing of a linear stapler (EndoGIA 60 mm, Tyco, New Haven, CT), blue load (Figure 4). The staple-line on the alimentary limb was reinforced by a 2/0 Vicryl running suture. Then the proximal end of the alimentary limb close to the gastrojejunostomy was separated from the latter by one firing of the blue load linear stapler (EndoGIA 60 mm, Tyco) (Figure 5). From this point up to the esophageal hiatus area, the gastric pouch was freed of adhesions with the distal stomach, and the stomach was sectioned by the coagulating hook just 3 cm distal to the esophagogastric junction. The specimen, containing the gastrojejunostomy, was retrieved.

The distal stomach near the lesser curvature was freed and opened by the coagulating hook. The gastrogastrostomy was performed by an entirely hand-sewn end-to-side one-layer technique, using two No. 1 polypropylene running sutures. The posterior layer began by a stitch at the cranial angle between the distal and the proximal stomach. In order to prevent a leak at the angle of the anastomosis, the posterior running suture was continued beyond the inferior angle of the anastomosis, thereby constituting the beginning of the anterior layer. A new running suture was started on

the opposite side to achieve the anterior layer of the anastomosis, and eventually reached the posterior running suture which had been continued up to the inferior third part of the anterior layer (Figure 6).

The jejunojejunostomy was performed by an entirely hand-sewn end-to-end one-layer technique, using two 2/0 polypropylene running sutures (Figure 7). The newly created mesenteric defect was closed by a No. 1 polypropylene purse-string stitch. The procedure ended with the leak-test of both anastomoses, by compressed air injected through the gastric tube. A drain was left near both anastomoses for 48 hours.

Results

Operative time was 95 minutes, and estimated intraoperative blood loss was 150 ml. The patient had an uneventful recovery and was discharged home on the 5th postoperative day. At 3 months follow-up, she was fine and the BMI was still 27 kg/m². At 6 months, the BMI was the same and a barium swallow showed good passage with good gastric motility (Figures 8A and 8B). After 1 year, the BMI is still unchanged and the patient is well. The patient is followed for weight loss surveillance, as agreed.

Discussion

In the literature, a number of examples of conversion of a standard RYGBP operation into another and vice-versa are reported. In 1984, Sugerma² reported the conversion of vertical banded gastroplasty (VBG) into RYGBP. This procedure is now routinely performed by laparoscopy,³⁻⁵ and in problematic cases after VBG, the conversion to RYGBP is a consideration.^{2,6} Moreover, in cases of insufficient weight loss or weight regain after standard RYGBP, the procedure can be converted into a distal gastric bypass⁷ or a biliopancreatic diversion.⁸ To our knowledge, however, this is the first report on laparoscopic restoration of an RYGBP into the normal anatomy.

The reason for this conversion was an incapacitating dumping syndrome, which is usually considered one of the mechanisms enforcing weight loss after RYGBP. This anatomic "restitutio ad integrum",

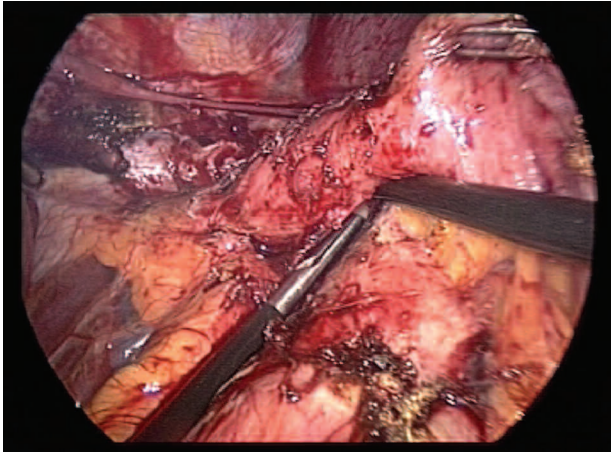


Figure 2. Identification of the old gastrojejunostomy and distal stomach.

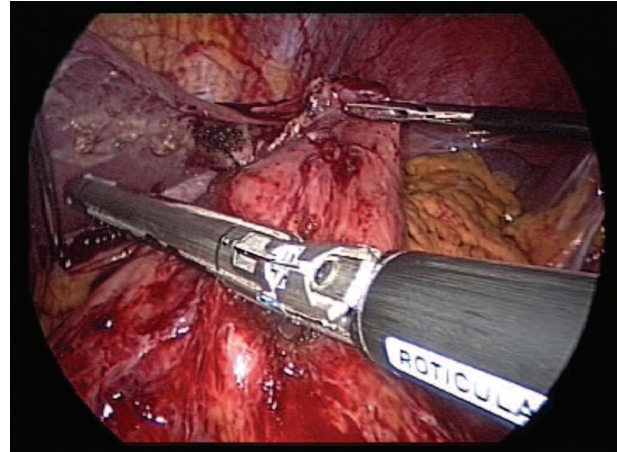


Figure 5. Section of the alimentary limb from the old gastrojejunostomy.

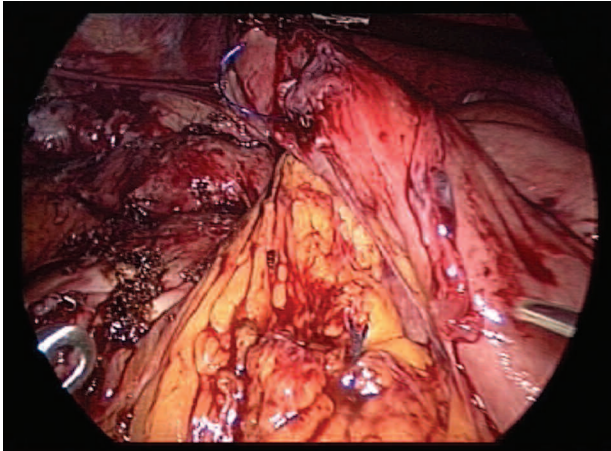


Figure 3. Petersen's space opening.

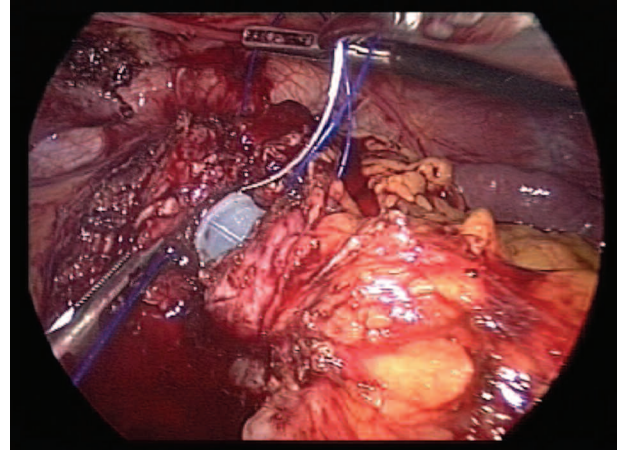


Figure 6. New totally hand-sewn gastrogastrostomy.

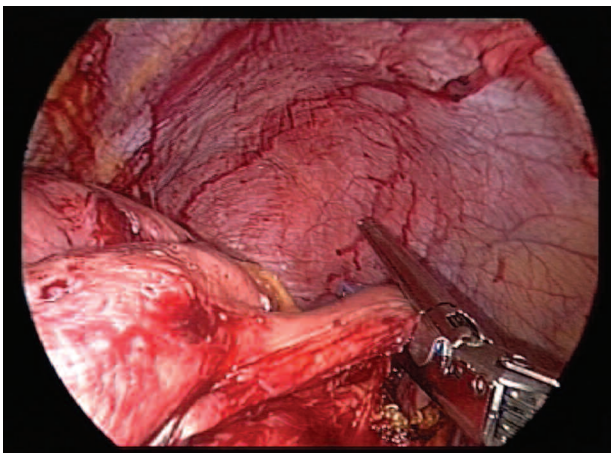


Figure 4. Section of the biliopancreatic limb from the old jejunojejunostomy.

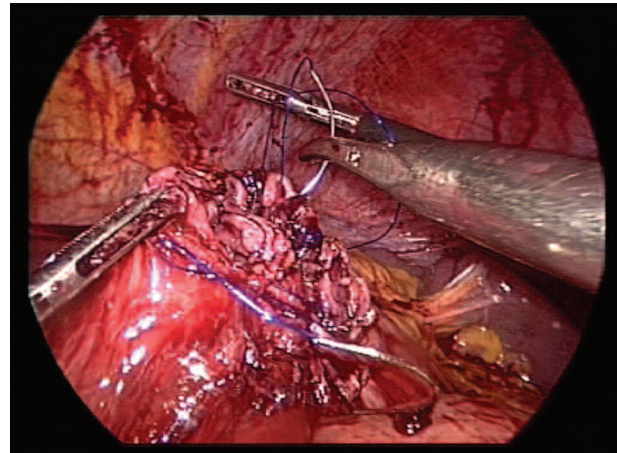
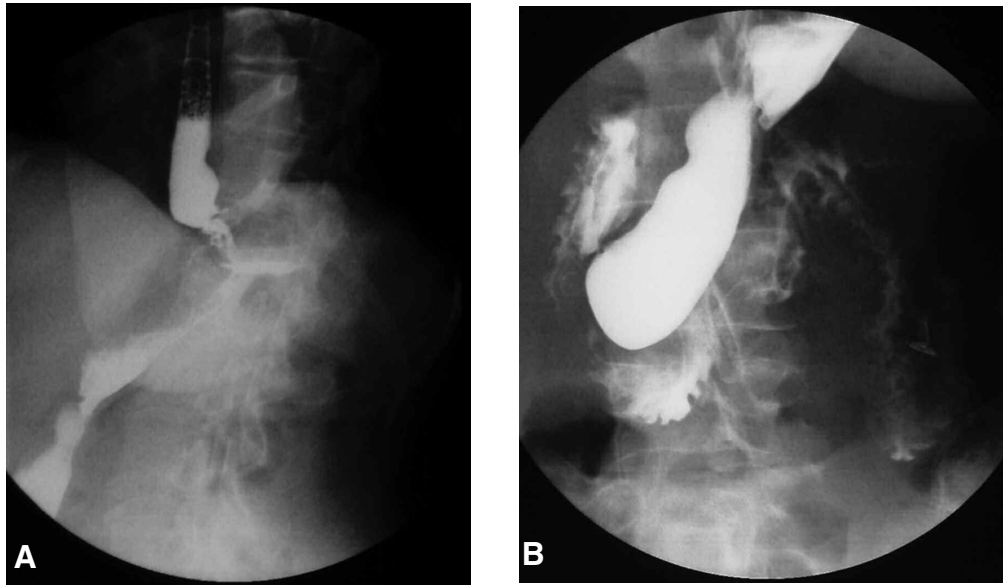


Figure 7. New totally hand-sewn jejunojejunostomy.

Laparoscopic Restoration of a RYGBP into a Normal Anatomy

Figures 8 A and B. Barium swallow at 6 months.

while efficient in curing the dumping problem, obviously carries the risk of weight regain. The relative ease of reversal after laparoscopic RYGBP can be considered an interesting technique.

Obese patients are known to have a higher incidence than the normal-weight population of cholelithiasis (25% vs 5%), cholecystitis (50% vs 17%) and cholesterosis (38% vs 6%).⁹ Additionally, rapid weight loss following bariatric surgery is a risk factor for cholesterol cholelithiasis in patients without preoperatively documented stones, reported to be 36% to 71%¹⁰⁻¹³ after the RYGBP and requiring urgent cholecystectomy within 3 years in 42% of cases.¹⁴ Diagnosis can be easily reached by Nuclear Magnetic Resonance cholangiography which carries a sensitivity of 93% and a specificity of 89%.¹⁵ However, the anatomic alteration of the RYGBP precludes a safe endoscopic approach to the biliary tree in almost all cases. The alternative – percutaneous transhepatic choledoscopic lithotomy using electrohydraulic lithotripsy – is less appealing and carries significant morbidity.^{16,17}

After a RYGBP, development of cancer in the excluded stomach is very rare but has been reported late after surgery, between 8 and 22 years.¹⁸⁻²¹ Obviously the bypassed stomach is inaccessible for routine endoscopy. Its approach demands more difficult and sophisticated techniques such as use of the Chiba needle puncture and contrast injection,²² ultrasound-guided percutaneous gastrotomy,²³ virtual gastroscopy,²⁴ or double-balloon endoscopy.²⁵

The metabolic consequences of the RYGBP, due to bypass of the duodenum, are rare, but can be disastrous: thiamine deficiency, zinc deficiency dermatitis and hair loss, iron deficiency anemia, or bone loss.²⁶ A very rare consequence of the duodenal bypass is the increased incidence of nesidioblastoma with extremely disturbing hypoglycemic spells. Multiple nesidioblastomas and insulinomas have been identified in patients after RYGBP with postprandial symptoms of neuroglycopenia due to endogenous hyperinsulinemic hypoglycemia.²⁷⁻²⁹ Pancreatectomy has been suggested for treatment of this condition, but restitution of the normal anatomy might be a less aggressive alternative, reducing the beta-cell trophic factors which had been increased as a result of RYGBP.

Restoration of a normal anatomy after RYGBP is technically feasible and may prove useful in the future. Its safety by the laparoscopic approach is highly dependent on surgeon experience and specifically training.

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