

# Roux-en-Y Gastric Bypass after Failed Vertical Banded Gastroplasty

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**Background:** Vertical banded gastroplasty (VBG) was the restrictive procedure of choice for many years. However, VBG has been associated with a high rate of long-term failure. We reviewed our experience of conversion of failed VBG to Roux-en-Y gastric bypass (RYGBP).

**Methods:** The data on all patients undergoing conversion of failed VBG to RYGBP were reviewed. Failed VBG was defined as insufficient weight loss (BMI >35 kg/m<sup>2</sup>) and/or VBG-related complications.

**Results:** We performed 24 conversions from VBG to RYGBP. Median age was 40±8 years (range 28 to 61). Preoperative weight was 111±25 kg (range 85 to 181), and median BMI was 41±8 kg/m<sup>2</sup> (range 30 to 69 kg/m<sup>2</sup>). Indication for conversion was: VBG failure in 18 patients and VBG complications in 6 patients. A gastrectomy (total or proximal) had to be performed in 5 cases (21%). The conversion was performed by laparoscopy in 13 cases. Postoperative complications occurred in 4 patients (16.7%). There were no leaks, nor mortality. Postoperative BMI was 31 kg/m<sup>2</sup> (range 25 to 42) at a median follow-up of 12 months (range 3 to 36 months). The average percentage of excess weight loss was 62% at 1 year.

**Conclusion:** VBG has been associated with a significant reoperation rate for failure and/or complications. Conversion to RYGBP is effective in terms of weight loss and treatment of complications after VBG. Gastrectomy and resection of the staple-line could reduce such complications as leaks and mucocele. Although technically challenging, conversion of VBG to RYGBP is feasible, with acceptable morbidity and no mortality. The conversion is feasible laparoscopically.

**Key words:** Morbid obesity, bariatric surgery, vertical banded gastroplasty, Roux-en-Y gastric bypass, reoperation, laparoscopy

## Introduction

Vertical banded gastroplasty (VBG) was the restrictive procedure of choice for many bariatric surgeons before the advent of laparoscopic adjustable gastric banding (LAGB). VBG was performed by laparotomy at the beginning and laparoscopically later. Long-term results with VBG were often disappointing. The reintervention rate for failure and/or complications, reported in long-term studies ranged from 49.7 to 56%.<sup>1,2</sup> Poor quality of life including frequent vomiting, gastroesophageal reflux disease and maladaptive eating behavior were frequently reported.<sup>3</sup>

Roux-en-Y gastric bypass (RYGBP) is our procedure of choice after failed restrictive procedures.<sup>4</sup> Conversion to RYGBP is reported to be superior to restoration of VBG in terms of weight loss and long-term results.<sup>2,5</sup> In these studies, conversion to RYGBP was reported to be technically difficult but safe.

The aim of this study was to review our experience with conversion from VBG to RYGBP.

## Patients and Methods

Between June 1999 and December 2006, 24 patients underwent conversion of VBG to RYGBP. The indication for conversion was failure of VBG (defined as BMI 35 kg/m<sup>2</sup>, weight regain, or poor control of comorbidities) and/or VBG complications (i.e. band erosion, stomal stenosis, gastro-gastric fistula).

All patients underwent an upper endoscopy and upper gastrointestinal contrast study before operation. Each patient was routinely evaluated by a multidisciplinary team (nutritionist, psychologist and surgeon), using a standardized protocol. Data for all

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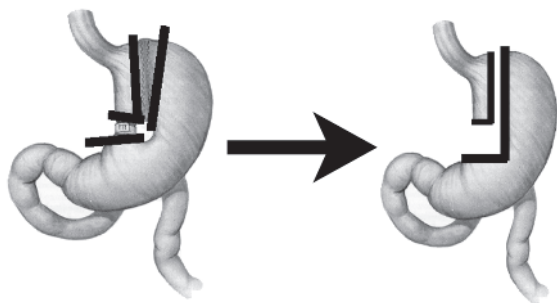
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patients were prospectively included in a database. Morbidity and mortality and weight reduction at follow-up visits were evaluated.

## Operative Technique

VBG was converted to a vertically divided RYGBP. A large-caliber (32-French) orogastric tube was inserted to delineate the VBG pouch. The band was identified and removed, and the staple-line was located. A narrow gastric tube was created using a 45-mm horizontal linear stapler above the VBG band and then a 60-mm vertical linear stapler. The vertical staple-line of the VBG were resected using the linear stapler with green 60-mm cartridge, to avoid gastric mucocele formation in the postoperative course.<sup>6</sup> The stomach around the band was also resected (Figure 1).

The jejunum was divided 70 cm distal to the duodenojejunal flexure, and a stapled side-to-side jejuno-jejunosomy anastomosis was performed, with a Roux limb length of 150 cm. The Roux limb was positioned antecolic to perform the gastro-jejunal anastomosis with the circular stapler (EEA25-mm). The anvil was inserted using the transoral technique. The anastomosis was tested with methylene blue instilled in the nasogastric tube. A Jackson-Pratt drain was placed behind the gastro-jejunal anastomosis. All mesenteric defects (Petersen's and at the jejuno-jejunosomy) were closed to avoid internal hernia. A nasogastric tube was left in place until the Gastrografin<sup>®</sup> swallow performed on postoperative day 4 showed a sealed anastomosis. Oral fluid intake was started, if no leakage and a correct passage of the Gastrografin<sup>®</sup> were demonstrated. The procedure was performed by laparotomy in the first 11 patients and then laparoscopically in the last 13 patients, even if the previous VBG was performed by laparotomy.



**Figure 1.** Resection of the band and of the staple-line.

## Results

Between June 1999 and December 2006, we performed 225 revisional RYGBPs: 201 of the revisions were for failed LAGB and 24 patients underwent conversion from VBG to RYGBP. There were 19 females and 5 males. Median age was  $40 \pm 8$  years (range 28 to 61). Preoperative weight was  $111 \pm 25$  kg (range 85 to 181) and median BMI was  $41 \pm 8$  kg/m<sup>2</sup> (range 30 to 69 kg/m<sup>2</sup>).

The indication for conversion was VBG failure in 18 patients and VBG complications in 6 patients (band erosion 4 and gastro-gastric fistula 2). The previous VBG had been performed by laparotomy in 22 cases and by laparoscopy in 2 cases.

The conversion was performed by laparotomy in 11 cases and then by laparoscopy in the last 13 cases. All of these 13 patients had undergone the previous VBG by laparotomy.

Three patients underwent a total gastrectomy (laparotomy), two for VBG band migration and one for gastro-gastric fistula. Two proximal gastrectomies (1 laparotomy, 1 laparoscopy) were performed because of scare tissue after intragastric band migration. The aim of these gastrectomies was to resect scarred tissue which was inadequate to perform the gastrojejunal anastomosis. In these cases, an esophagojejunosomy was performed with the same technique using a circular stapler with transoral technique for the anvil and we used a transmesocolic approach to be able to perform a tension-free esophago-jejunal anastomosis.

The operative time was  $180 \pm 60$  min in 11 patients undergoing laparotomy versus  $240 \pm 60$  min in the 13 patients who underwent a laparoscopic procedure ( $P < 0.05$  with student *t*-test). Operative time was significantly longer in the laparoscopic group.

An intraoperative complication occurred in one patient (laparotomy)(4%): splenic injury requiring splenectomy.

Additional surgical procedures were performed in 5 patients, including 5 cholecystectomies and 3 incisional hernia repairs.

One patient had to be reoperated 2 hours after surgery because of significant bleeding in the nasogastric tube. The origin of the hemorrhage was the circular staple-line of the gastro-jejunosomy. We had to redo the anastomosis to stop the hemorrhage. Other early

postoperative complications included two incisional wound abscesses. The overall morbidity rate was 16.7%.

There were no anastomotic leaks nor perioperative deaths. No patient has stenosis of the gastro-jejunal anastomosis. The rate of stenosis of the gastro-jejunal anastomosis in our primary RYGBP using the same transoral technique is 7%.

The postoperative BMI was 31 kg/m<sup>2</sup> (range 25 to 42) at a median follow-up of 12 months (range 3 to 36 months). The average percentage of excess weight loss was 62% at 1 year (Metropolitan Tables).

## Discussion

Frequency of revisional bariatric operations will rise in the next year. The most performed restrictive procedures worldwide are VBG and LAGB. Many patients with VBG<sup>1,2</sup> or laparoscopic gastric banding<sup>4</sup> will require revisional surgery for insufficient weight loss and/or complications. For us, conversion to RYGBP is the procedure of choice after a failed restrictive procedure.<sup>4</sup> In this indication, RYGBP provides good results in terms of weight loss and allows the correction of complications. RYGBP has been reported to offer better results in terms of weight loss than restoration VBG.<sup>2,5</sup> Furthermore, frequency of vomiting is significantly less and quality of eating is significantly better in RYGBP than in VBG patients.<sup>7</sup> RYGBP as a revisional procedure is technically challenging and is associated with higher morbidity and mortality.<sup>8</sup> If the conversion is performed laparoscopically, it is associated with a higher rate of conversion than primary RYGBP.

In this study, laparoscopic conversion of open VBG to laparoscopic RYGBP has been possible in 13 cases (54%) with acceptable morbidity and without mortality. High leak rates have been reported after conversion of VBG to RYGBP. In our study, there were no leaks at the gastro- or esophago-jejunosomy. We believe that performing the anastomosis in an unused portion of the stomach (above the band) could explain the low leak rate. We also believe that circular anastomosis using the transoral technique is safer than a linear or hand-sewn anastomosis in revisional RYGBP.

As in our primary RYGBP, we performed a long and narrow gastric tube, and we performed the gastro-jejunal anastomosis a few centimetres above the VBG band. Furthermore, in the case of abundant scar tissue,

we performed a gastrectomy (total or proximal) to remove these tissues. In these cases, using a circular stapler with the transoral technique allowed us to perform an esophago-jejunal anastomosis in a safe condition even by laparoscopy. A gastrectomy was necessary in 5 cases (21%). Among them 4 had band erosion.

The other major technical concern after conversion of VBG is mucocele of the gastric tube.<sup>6</sup> Resection of the staple-line of the VBG avoids this complication. We used a calibration tube to calibrate the gastric tube. This tube helped to delineate the VBG pouch and to localize the vertical staple-line which should be resected. To avoid dehiscence of the staple-line in these scarred tissues, we used a green cartridge for the linear stapler.

An intact band (non-obstructive and non-eroded) can be left in place.<sup>9</sup> However, we prefer to remove the band in all cases to avoid later complications related to the band.

RYGBP after VBG is technically challenging, even more than conversion of a LAGB. At the beginning of our experience, we performed these conversions by laparotomy, but gaining experience allowed us to perform these conversions by laparoscopy even in cases of previous open VBG. We did not record operative time, but our impression is that it is 1-2 hours longer than for a primary RYGBP.

The long-term efficacy and safety of converting a VBG to RYGBP has been previously documented.<sup>2,10-13</sup> With an excess body weight loss of 62% and a decrease of BMI from 41 kg/m<sup>2</sup> to 31 kg/m<sup>2</sup>, our results are comparable to those already published.<sup>9, 11, 14, 15</sup>

In summary, restrictive bariatric surgery and particularly VBG, in our experience, has been associated with a significant reoperation rate for failure and/or complications. Conversion to RYGBP has been documented to be effective in terms of weight loss, quality of life and treatment of complications after restrictive procedure.<sup>15</sup> Although technically challenging, conversion of VBG to RYGBP has been feasible with acceptable morbidity and no mortality. The conversion is feasible laparoscopically.

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