



## The laparoscopic banded gastric bypass – operation technique

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### Abstract

*The banded Roux-en-Y gastric bypass can be used as a primary or revisionary bariatric procedure. This article describes the operation technique including materials, size and placement of the banding and gives an overview concerning evolution and indications of the operation. A video of a primary banded Roux-en-Y gastric bypass is presented.*

**Key words:** bariatric surgery, gastric bypass, GaBp ring.

### Introduction

The beginning of what is known today as the “banded gastric bypass” operation can be found in the 1980s. After failed vertical banded gastroplasty (VBG), patients were scheduled to receive a gastric bypass as a revisionary operation. When the VBG was intact, e.g. no rupture of the vertical stapler line was seen, the gastrojejunostomy was created distal to the silastic ring or mesh band, without removing the implant [1]. It was found that leaving the band led to better weight loss than removing it during the revisionary operation. The next consequent step in 1989 was the stapled banded gastric bypass as a primary procedure followed by the transected banded gastric bypass in 1992 by Fobi to reduce the risk of gastro-gastric fistulas [2, 3]. This operation was initially performed with a temporary gastrostomy tube in the remnant stomach, which was expected to prevent acute gastric dilation and could be used as an alternative route for medication and fluid intake in the early postoperative phase [2]. Over time, different materials were used to perform the banding: autologous materials such as the linea alba or fascia lata graft as well as xenografts (bovine and porcine mate-

rials) were rarely used. More common were synthetic materials such as Marlex™, Gore-Tex™ or silastic implants [1, 4, 5]. A modern implant is the GaBP Ring System (Bentec, Woodland, CA), a silastic ring with a locking mechanism which can be implanted in laparoscopic and open operations. It is available in various sizes.

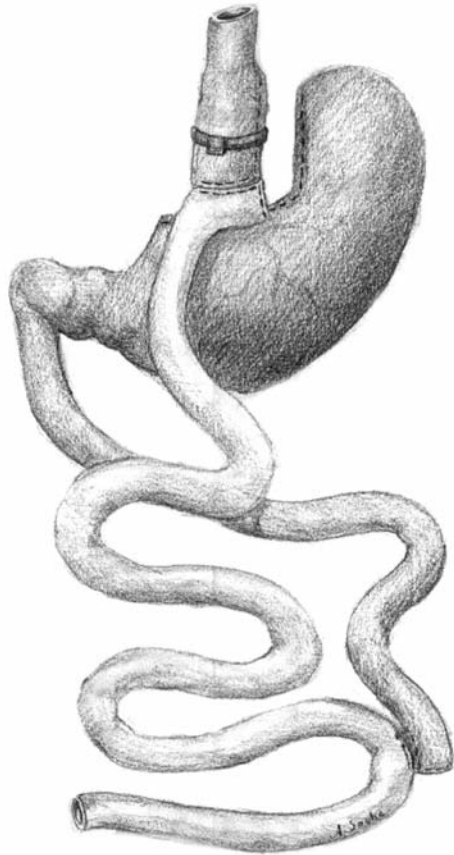
The banded Roux-en-Y gastric bypass (BRnYGB) is used as a primary or secondary operation nowadays (Figure 1, 2). It can be used as a revisionary procedure after VBG, as described above. It can also be used as a revision after RnYGB if the patient regains weight [6]. In these cases, computed tomography of the abdomen including gastric pouch volumetry should be performed (Figure 3) [7]. If the gastric pouch is dilated, a revision with reduction of the pouch size and placement of the GaBP ring system to prevent re-dilation may be indicated [8]. This operation transforms the RnYGB into a BRnYGB (Figure 2).

### Operation technique

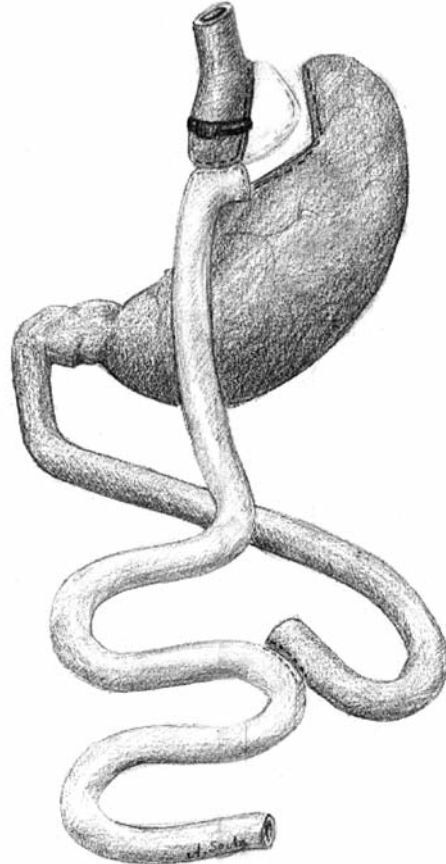
In the presented film, we show a primary BRnYGB in a 38-year-old woman. The operation is performed as a two-surgeon procedure. The patient is posi-

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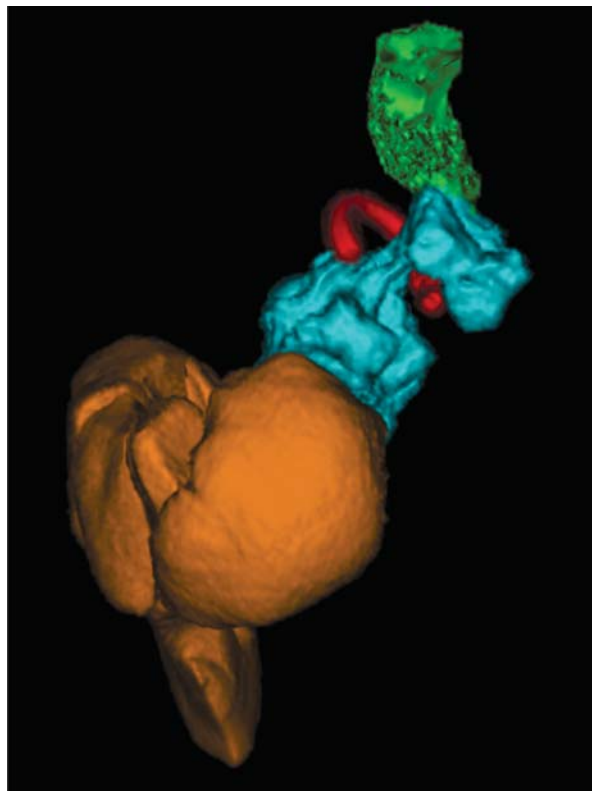
**Figure 1.** The banded bypass as performed in the Freiburg Center of Bariatric and Metabolic Surgery, without serosal patch and drainage of the remnant gaster



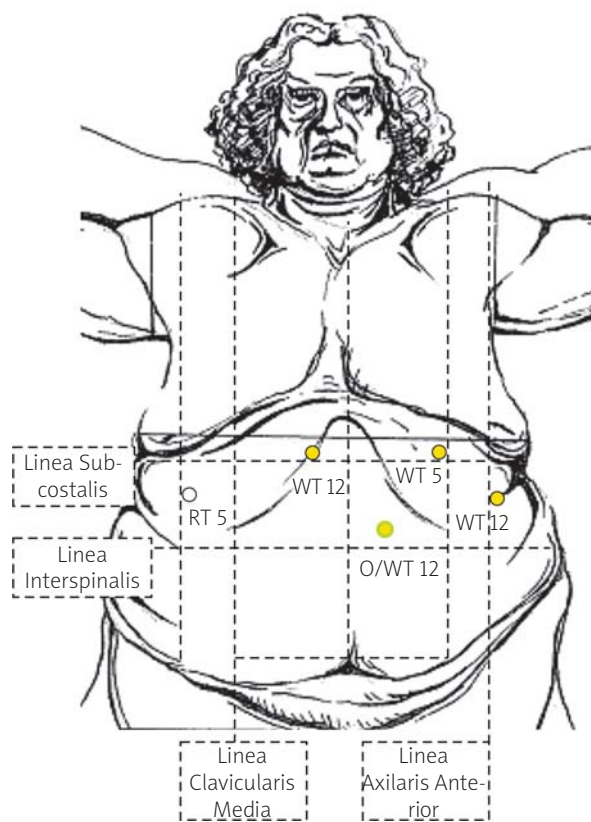
**Figure 2.** The banded bypass as a revisionary operation after standard Roux-n-Y gastric bypass with pouch dilation

tioned in the lithotomic position and reversed Trendelenburg tilt. The surgeon stands between the patient's legs and one assistant stands on the left side of the patient. After insufflation of the capno-peritoneum via a 12 mm separator trocar (Applied Medical, Rancho Santa Margerita, CA), four working trocars are placed under direct view as shown (Figure 4). After lifting the left lobe of the liver aside, the subcardiac region is exposed. As shown in the film, the dissection is now started in the area of the angle of His, using the LigaSure™ instrument (Covidien, Dublin, Ireland). Then, the dissection is continued at the lesser curvature, 7-8 cm below the cardia. Here the omentum minor is dissected, and preparation is continued towards the left crus of the diaphragm. After insertion of a 32 F gastric tube the dimension of the pouch is now marked, and the gastric pouch can be separated using 3 to 4 linear sta-

plers (blue cartridge, Covidien, Dublin, Ireland). The 32 F gastric tube should be removed prior to stapling. The pouch volume should be 15 to 25 ml [9]. The stapling line of the pouch is oversewn with a 3-0 resorbable running suture. Now the GaBP Ring is placed 2 cm from the distal end-point of the pouch. It is closed and fixed with two non-resorbable sutures. We usually use rings with a circumference of 6 to 6.5 cm. The alimentary limb is created by dividing the jejunum 50 cm below the ligament of Treitz. Here we use a 45 mm Endo-GIA stapler (Covidien, Dublin, Ireland) with a white cartridge. We perform the gastroenterostomy in an antecolic and antegastric manner. The anastomosis is performed with an Endo-Gia stapler (Covidien, Dublin, Ireland), The opening for the stapler is closed with suture and the anastomosis is oversewn with a running absorbable suture. The integrity of the anastomosis is tested using methyl-



**Figure 3.** Abdominal CT with 3D-imaging after BRnYGB: green: esophagus, blue: gastric pouch, orange: roux-limb, red: GaBP-ring



**Figure 4.** Trocar placement for BRnYGB. RT 5: Retractor trocar 5 mm, WT 12: working trocar 12 mm, WT 5: working trocar 5 mm, O12: optical trocar 12 mm

ene blue. As the last step, the Roux anas-tomosis is created 150 cm below the gastroen-terostomy, side to side using a 45 mm Endo-Gia stapler and a running suture closing the openings for the stapler. A Blake drain is used if necessary, the capnoperitoneum is released and an absorbable skin suture performed. We do not drain the remnant stomach.

### Discussion

The Roux-en-Y gastric bypass is the gold standard in bariatric surgery. Why then should we perform the “banded bypass”, which is a more complicated and more expensive method? As described before, the banded bypass was initially performed as a re-visionary operation after VBG, especially when the band could not be easily removed. It was seen that these patients showed better weight control than the patients whose bands were removed during the re-vi-

sion [1]. Since then, other studies have been performed comparing the RnYGB and the BRnYGB, favouring the latter [4]. A multicentre randomized prospective study is currently underway (Karcz, Freiburg). Like other operations involving implants, the BRnYGB has some drawbacks. Infection, dislocation or migration of the ring or band might lead to severe complications or even the need for reoperations [10, 11, 12]. However, according to the literature, this seems less frequent than in the case of gastric banding [13, 14]. These drawbacks and the cost of the implant might be the reason why the BRnYGB is not used as a standard operation, although some surgeons use it routinely [12, 15]. Nevertheless, the banded bypass seems to be a useful revisionary operation, in case of a dilated RnYGB pouch, or a dilated gastroenterostomy after RnYGB [6, 8]. Abdominal CT with 3D imaging and pouch volumetry is a very helpful diagnostic tool, so we use it routine-

ly in patients with insufficient weight loss or regain of weight [7]. There are different materials available to perform the banding. In our opinion, silastic materials should be used, as they induce a capsule which will keep the implant in place, but are still much easier to remove than a mesh which will be embedded in scar tissue. A pre-formed auto-locking implant like the GaBP Ring also has some advantages: It is relatively easy to place and lock; moreover the diameter is standardized, which allows better scientific evaluation. A band circumference of 5.5 to 7 cm equals an internal band diameter of 1.75 to 2.2 cm which results in an interluminal diameter of 1.15 to 1.6 cm. It is reported that bigger rings (6-6.5 cm) lead to better solid food tolerance, a lower frequency of ring removals, but still the same weight loss as small rings [16-18]. Therefore, we favour a ring with 6 or 6.5 cm circumference. Concerning the gastroenterostomy, different techniques exist: hand-sewn, a stapler anastomosis with hand-sewn closure of the stapler openings or use of the CEE stapler, whereas the combined (stapled and hand-sewn) technique provides the lowest stricture rate [17]. Fobi uses the proximal part of the Roux limb as a serosal patch on the edge of the pouch to prevent leaks and gastro-gastric fistula [2, 17].

## Conclusions

Our film presents a primary laparoscopic banded Roux-en-Y gastric bypass. A standardized operation technique can be achieved using the auto-locking GaBP silicone ring. Important parameters are the pouch size, the placement and diameter of the ring and the diameter of the gastroenterostomy. The banded gastric bypass is also suitable as a revisionary operation in case of pouch or stomal dilatation after RnYGB. Whether the banded bypass surpasses the standard gastric bypass in terms of weight control and usage as a standard operation is currently under investigation in a prospective controlled multicentre trial.

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