

Modern Surgery: Technical Innovation

Placement of the GaBP Ring System in the Banded Gastric Bypass operation

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Introduction

The banded gastric bypass (BGBP) operation for morbid obesity is a serendipitous evolution from both the Mason gastric bypass (GBP)¹ and the vertical banded gastroplasty (VBG) operations.^{1,2} Between 1983 and 1989, failed VBG and silastic ring vertical gastroplasty (SRVG)³ operations that were anatomically intact, were converted to a GBP with the gastrojejunostomy constructed distal to the band, because it was unsafe to remove the Marlex mesh band. Leaving the band above the gastrojejunostomy was found to provide better weight loss

in more patients, that was maintained over a longer time than had been observed with either the primary GBP or VBG operations.⁴⁻⁷ This prompted the performance of the stapled banded gastric bypass in 1989,⁸ which was subsequently modified to the transected banded gastric bypass with a temporary gastrostomy tube (GTT) and a GTT-site marker, ordinarily called the Banded Gastric Bypass (BGBP) (Figure 1).^{9,11} The band used in this operation (6.0-7.0 cm long) is longer than in the gastroplasty operations (4.2-5 cm long), thus providing larger stomas and less solid food intolerance than in the gastroplasty operations.

Surgeons have usually fashioned the band or ring used in these operations from various materials: linea alba, fascia lata, Gore-tex®, Marlex mesh, Silastic tubing, porcine graft and bovine graft, etc.

The GaBP Ring System is a pre-manufactured set with a prosthetic 'auto-locking' band (GaBP Ring) and a radiopaque marker (Gastrostomy site marker) (Figures 2, 3 and 4) that can be used by surgeons instead of the band or ring usually fashioned by surgeons. The GaBP Ring is radiopaque and made from implant-grade silicone rubber. The ends of the band have a plastic one-way locking mechanism. A removable disposable GaBP Ring introducer component is affixed to the female end of the locking mechanism. Also, a disposable protective latch cover is placed over the prongs of the male end of the GaBP Ring. This band can be placed in both open and laparoscopic operations. It definitely makes the band placement in the laparoscopic approach simpler and easier. In addition, a pre-manufactured band provides for better standardization and quality control than surgeon-fashioned bands or rings.

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Surgical Technique

After the transected vertical pouch of approximately 15-20 cc volume has been created for the gastric bypass operation (Figure 5), introduce the GaBP Ring into the peritoneal cavity (Figure 6). In the laparoscopic approach, this will pass through a 10-12 mm trocar. The GaBP Ring is then placed circumferentially around the transected pouch approximately 2 cm proximal to the distal tip of the pouch. This is done by making a window through the lesser omentum using a right-angle clamp in the open case and a regular grasper in the laparoscopic approach (Figure 6). Thread the tapered tip of the GaBP Ring introducer through this window by grasping it with the right-angle clamp or grasper and pulling it through the window with a gentle curving motion (Figures 7 and 8). At this point, the female portion of the GaBP Ring is grasped with a grasper (We use the Anvil Grasper™, Wolf). The GaBP Ring introducer is then separated from the female catch portion of the GaBP Ring Auto-lock, and removed from the peritoneal cavity (Figure 9).

The other end of the GaBP Ring has a soft protective latch-cover on the male prongs of the latch. Grasp the protective cover with a grasper (A) and align it so that another grasper (B) can grasp the shoulder of the male latch and lock on. I use a bulldog clamp (Wave Side Atraumatic Grasper™, Wolf) for this (Figure 10). The protective cover is then separated from the male prong (Figure 11).

With both sides of the GaBP Ring locking mechanism now firmly held, push the two ends together, ie. male prongs into the female catch portion to lock (Figures 12 and 13). A gentle tug on the GaBP Ring once connected with a grasper will assure that the locking mechanism is secure. Place an absorbable suture around the ring on the rubber section, anchoring it to the pouch to prevent slippage or angulation. (Figure 14). A capsule will form around the ring within weeks to keep it in place.

The Roux jejunal limb (ante-colic/ante-gastric *or* retro-colic/ante-gastric *or* retro-colic/retro-gastric) is now anastomosed to the pouch distal to the GaBP Ring, to establish the gastrojejunal continuity and complete this portion of the operation. This anastomosis can be hand-sewn, or formed with a linear endosurgical stapler and hand-sewn, or formed with an EEA or ILS stapling device.

A gastrostomy tube (GTT) is placed in the bypassed stomach to decompress it in the postoperative period and for nutritional support if needed. The bypassed stomach marker is placed around the gastrostomy site to facilitate percutaneous access for radiological or endoscopic and other evaluations of the bypassed stomach, as need arises.¹²

A purse-string suture is then placed for the GTT, and the radiopaque ring is introduced into the peritoneal cavity and placed adjacent to the planned gastrostomy site (Figure 15). A gastrostomy is made in the center of the purse string with an electrocautery in the open approach or with a harmonic scalpel in the laparoscopic approach (Figure 16). A hole is made through the abdominal wall at the proposed GTT exit site, using a tonsil clamp in the open case or a 5 mm trocar in the laparoscopic case. A 16-Fr Foley catheter is passed into the peritoneal cavity, and is guided through the radiopaque ring and gastrostomy into the bypassed stomach (Figure 17). The balloon is inflated, and the purse-string suture is pulled and tied to maintain the catheter in the bypassed stomach (Figure 18). Two non-absorbable sutures are placed from the stomach wall (within the gastrostomy-site marker) to the abdominal wall anterior and posterior to the exit-site of the GTT (Figures 19 and 20), the stomach is pulled up to the abdominal wall, and the sutures are tied, trapping the gastrostomy-site marker in place (Figure 21). A third suture may be required to provide a complete seal around the GTT. This completes the operation.

Comment

The GaBP Ring system has been placed in 172 patients both in open and in laparoscopic banded gastric bypass operations, between Apr 1, 2003 and June 15, 2005. It takes less than 5 minutes to place the band and secure it in place. One ring was removed subsequently in a patient who developed a leak with gross contamination of the GaBP Ring. Another ring that was placed laparoscopically was removed laparoscopically 10 months postoperatively because of solid food intolerance by the patient. No ring erosion has been observed in our series with a follow-up of up to 26 months.



Figure 1. Banded gastric bypass.

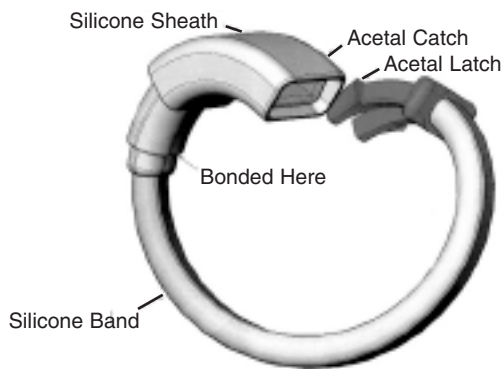


Figure 2. GaBP Ring Auto-lock.

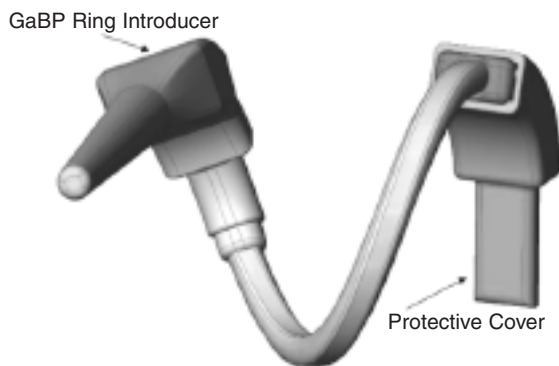


Figure 3. GaBP Ring.



Figure 4. Gastrostomy-site marker.

Creation of vertical pouch with limb imbrication of staple-line

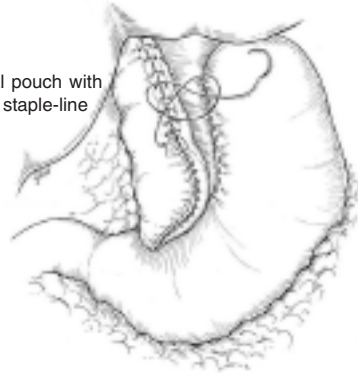
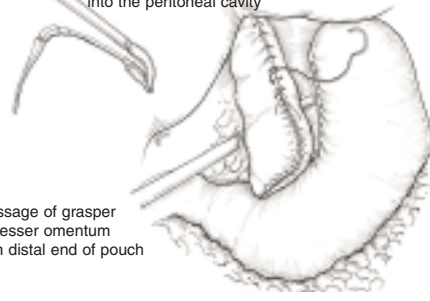


Figure 5. Vertical gastric pouch created.

Insertion of GaBP Ring through a 10-12 mm trocar into the peritoneal cavity



Blunt passage of grasper through lesser omentum 2 cc from distal end of pouch

Figure 6. Passage of grasper through lesser curvature omentum, and introduction of GaBP Ring into the peritoneal cavity.

Use grasper to guide introducer through the lesser omentum

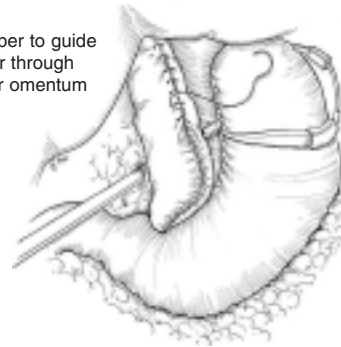


Figure 7. Guiding introducer through the lesser omentum.



Figure 8. Pull introducer and GaBP Ring through the lesser omentum.

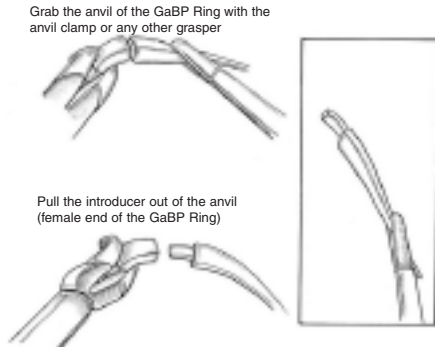


Figure 9. Separation of introducer from the female end of GaBP Ring.

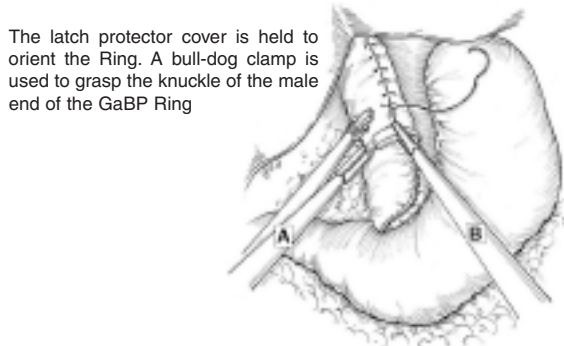


Figure 10. Protective latch cover on the male prongs are held to align for grasping.

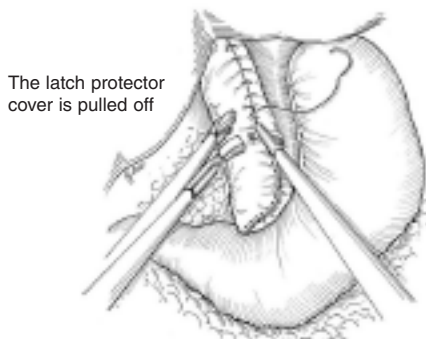


Figure 11. Separation of protective latch from male end of GaBP Ring.

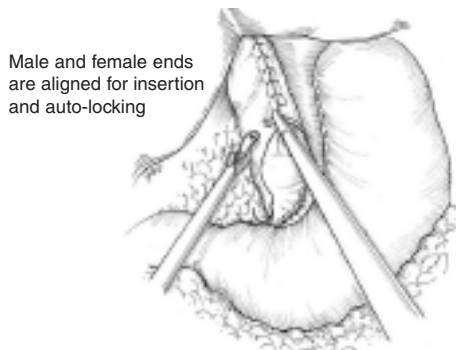


Figure 12. Align both ends of GaBP Ring for insertion.



Figure 13. GaBP Ring auto-locks once inserted.

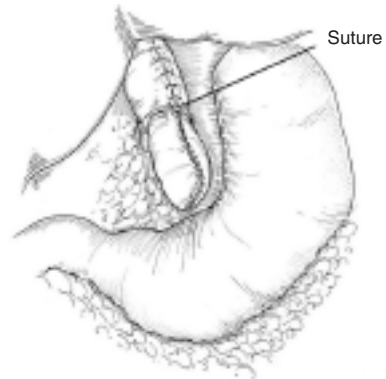


Figure 14. Sutured GaBP Ring in place.

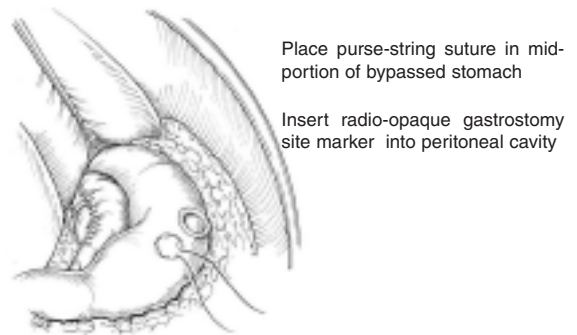


Figure 15. Purse-string placement and insertion of marker.

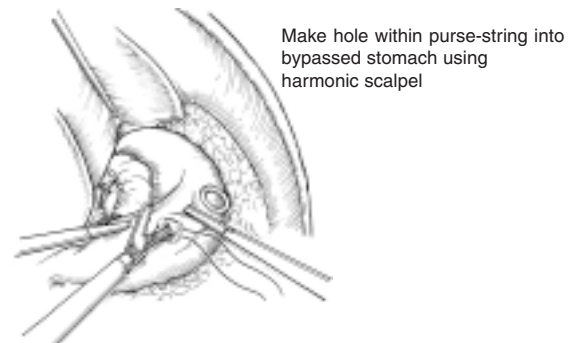


Figure 16. Creation of gastrotomy within purse-string.

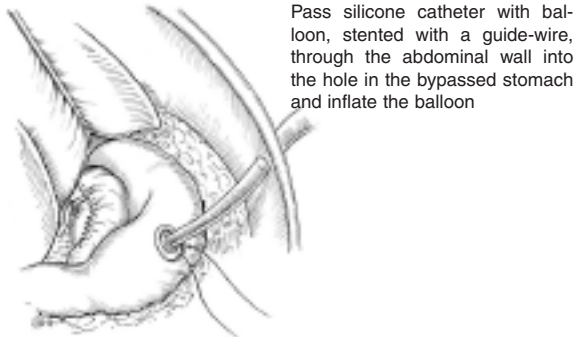


Figure 17. Insertion of GTT through the radiopaque ring and into the stomach.

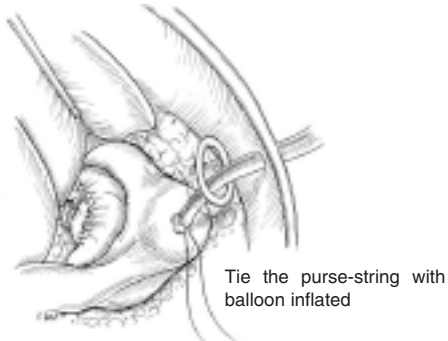


Figure 18. Inflation of catheter balloon and tying of purse-string suture.

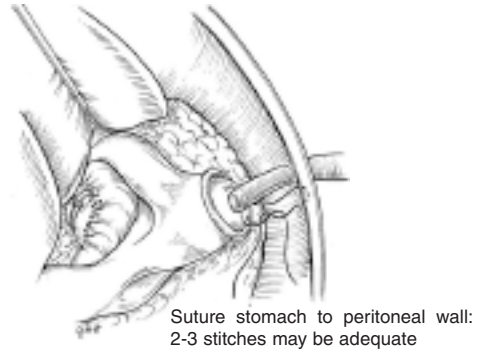


Figure 19. Place suture from stomach to peritoneal wall within radiopaque ring.

Posterior aspect of stomach sutured to peritoneal wall within the gastrostomy site marker

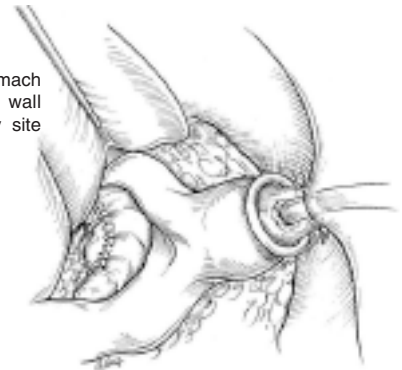
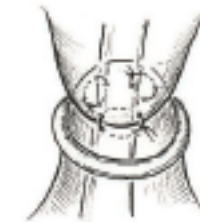
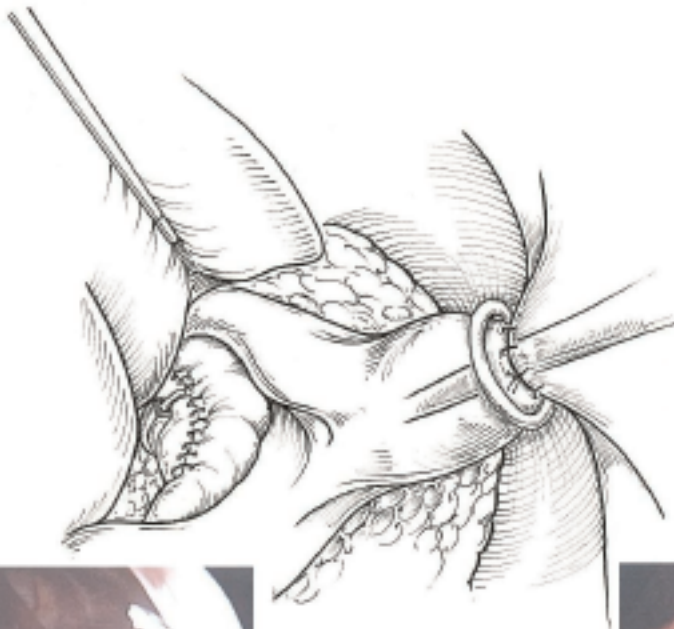


Figure 20. Posterior wall suture tied.



Anterior aspect of stomach sutured to peritoneal wall within the gastrostomy site marker



Figure 21. Anterior wall suture tied.

References

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