Obesity Surgery, **5**, 71–73

Modern Surgery: Technical Innovations

Laparoscopic Placement of Adjustable Silicone Gastric Banding : Early Experience

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Background: the authors describe a laparoscopic technique for the positioning of stoma adjustable silicone gastric banding (SASGB), which respects the main steps of the open procedure. Methods: (1) patient position: supine with thighs abducted and 30° reverse Trendelenburg; (2) Four 10 mm trocars (supra-umbilical, sub-xiphoid, right upper quadrant, left upper quadrant) and an 18 mm trocar (left subcostal); (3) exposure of the subcardial area; (4) measurement of the pouch; (5) dissection of the lesser and greater curvatures; (6) retrogastric tunnel; (7) introduction and placement of the band; (8) band closure and stoma calibration; (9) retention sutures. Results: results obtained in a first (1992) series of five patients who underwent the laparoscopic application of the regular SASGB and results of a second series (1993–1994) of seven patients in whom the new LAP-ASGB was utilized are reported. Conclusion: this new approach can represent a major achievement in bariatric surgery, as it combines the minimal invasiveness of the laparoscopic approach with the reversibility of SASGB.

Key words: Laparoscopy, gastric banding, surgery, morbid obesity

Introduction

Kuzmak's gastric banding technique is the least invasive operation for morbid obesity and has proven its efficacy.[1] Access by the laparoscopic approach limits trauma to the abdominal wall and could therefore diminish the post-operative morbidity rate and hospitalization time.

Presented in Symposium 'Laparoscopic Approaches' at the 11th Annual Meeting of the American Society for Bariatric Surgery, Minneappolis, USA, 9 June 1994.

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G. B. Cadière first showed the feasibility of the laparoscopic positioning of stoma adjustable silicone gastric banding (SASGB) in 1992.[2] The recent modification of the traditional SASGB and the availability of dedicated instruments have made possible the laparoscopic application of SASGB on a routine basis.

With the experience gained in more than 200 open procedures, the authors developed a laparoscopic technique which fully respects the main steps of the open procedure. We report in this paper our early experience with the laparoscopic application of the regular SASGB (1992) and with the LAP-ASGB (1993–1994).

Materials and Methods

Patients

We analyze two series of patients: (1) Between September and December 1992, five morbidly obese patients (four female, one male) underwent the laparoscopic application of a regular SASGB. Patients' mean characteristics were: age 43 years (range 39–60); body weight (BW) 128 kg (range 102–166 kg); per cent ideal body weight (% IBW) 198 (range 164–244%); body mass index (BMI) 45 (range 41–57).

(2) Between September 1993 and February 1994, seven morbidly obese women underwent a laparoscopic application of LAP-ASGB. Patients' mean characteristics were: age 39 years; BW 98 kg (range 83–110 kg); per cent IBW 168 (range 150–190%); BMI 38.4 (35–45).

The follow-up consisted of a clinical control and body weight measurement 2 and 4 weeks post-operatively and then every 2 months. As the aim of any

treatment for obesity is loss of excess body weight, we used the percentage loss of excess body weight (per cent EWL) to show post-operative weight loss together with the variations of the BW, per cent IBW and BMI.

LAP-BAND Adjustable Gastric Banding System (LAGB)

The LAP-BAND adjustable gastric banding system consists of: adjustable gastric band, injection reservoir, calibration tube, lap-band closure tool and gastrostenometer electronic sensor (INAMED, Carpinteria, CA, USA).

The laparoscopic band is a 13 mm wide band which, when fastened, forms a circular ring with an inside circumference of 9.75 cm or 10 cm (supplied in two standard sizes) and transitions to a 50 cm long silicone tube). The band is made of silicone elastomer, chosen for its biocompatibility and inertness. The inner surface of the band is inflatable. The radiopaque kink-resistant tube is used to connect the inflatable section to the subcutaneous Injection Reservoir. An end plug is provided to seal the system while the band is being passed around the stomach.

Equipment

The equipment used was a standard 0° and 30° laparoscopic telescope, camera, video and screen. A selection of 5, 10 and 18 mm trocars, as well as a set of Roticulator Endograsp, Endodissect, Endoscissors, Endoclip, EndoBabcock, fan liver Retractor and cautery hook should be available.

Operative procedure.

The main steps of the procedure as developed at our Institutions are as follows:

(1) Patient position. The patient lies in lithotomy position. The operating-table has a 30° reverse Trendelenburg tilt. The surgeon stands between the patient's legs, the first assistant on the patient's left side and the second on the right.

(2) Position of the trocars. Five trocars are placed in the following sequence:

(a) 10 mm trocar (long) for endoscope (at the junction of the upper two-thirds with the lower third of the xyphi-umbilical line).

(b) 10 mm trocar for the liver retractor (sub-xyphoid).

(c) 10 mm trocar for grasping forceps and lap-band closure tool (in right upper quadrant).

(d) 5 mm trocar for cautery hook, needle holder and grasping forceps (in left upper quadrant).

(e) 10 mm trocar for EndoBabcock later replaced by a 18 mm trocar for band introduction and reservoir replacement (on the left anterior axillary line below the costal margin).

(3) Exposition of the subcardiac area by lifting the left lobe of liver and by pulling up the fundus.

(4) Measurement of the pouch. The balloon of the calibrating tube, advanced in the stomach by the anaesthetist, is inflated with 25 cc of air and pulled up at the gastro-oesophageal junction. This allows the surgeon to correctly select where, along the lesser curvature and into the phreno-gastric ligament, to start the blunt dissection.

(5) Retrogastric tunnel. The balloon is deflated and the calibrating tube removed. The lesser curve is then dissected with the coagulating hook about 2–3 cm from the cardia, preserving the nerve of Latarjet. A retrogastric tunnel, joining this area with a similar one freed along the fundus, is created by blunt dissection under direct vision with the stomach being held ventrally. The dissection has to be very limited in order to prevent band and/or stomach slippage. An Endo-Grasp Roticulator is introduced into the tunnel and left in place.

(6) Introduction and placement of the Band. The E port is replaced by a 18 mm one. The lap-band is introduced through this latter port and placed around the stomach at the level of dissection, utilizing the previous endo-grasp roticulator. The band is then closed around the calibration tube advanced again by the anaesthetist and its inflatable part filled with saline till a satisfactory calibration is read in the gastrostenometer electronic sensor.

(7) Anti-slippage sutures. A few stitches are placed between the sero-muscolar layer of the stomach just proximal and distal of the band to avoid slippage.

(8) Placement of the injection reservoir. The reservoir is connected with the band through the trimmed non-kinking connecting tube and is buried in the subcutaneous tissue above the distal part of the left rib cage. Usually it is not necessary to enlarge the 18 mm trocar opening.

Results

The average duration of the operation was 2 h (range 40–240 min).

After a follow-up of 18 months the five patients of the 1992 series showed a BW of 90 kg (range 75–115 kg), a per cent IBW of 140 (range 110–169%), a BMI of 32 (range 24–39) and a per cent EWL of 68 (range 25–89%). The only complication in this series was a pouch perforation due to malpositioned nasogastric tube.

Table 1. Lap-band: early results

PTS N	7	4	3	1
Months	0	3	6	9
Per cent EWL	—	34	53	61
Per cent IBW	170	148	134	119
BMI	38	34	30	28
BW (kg)	97.6	83.5	78.7	66

The weight loss of the 1993–1994 series is reported as a variation of BW, per cent EWL, per cent and IBW and BMI (Table 1). One major perioperative complication occurred: one patient underwent a second open procedure 2 weeks later due to slippage of the distal stomach above the banding. At laparotomy the herniated stomach was reduced, the banding was left in the original position and further anti-slippage sutures were applied.

No other complications were observed. The duration of the post-operative hospital stay was 2–3 days. After radiological control with peroral contrast, the patients were permitted to ingest liquid as of the first post-operative day.

Discussion

In the treatment of morbid obesity gastric restrictive operations play a major role, being the techniques most often employed.[3] In 1986, Kuzmak introduced the SASGB technique,[1] which is gaining a wide acceptance for its limited invasiveness and total reversibility.

One of us, G. B. Cadière, first showed the feasibility of the laparoscopic approach in 1992, utilizing the regular inflatable band in our 1992 series.[2]

Even though the results were very satisfactory it was immediately obvious that, if the laparoscopic approach was to become a standard treatment, a few modifications of the regular inflatable band had to be introduced and that some specific instruments had to be made available.

In fact the laparoscopic band, recently devised by the manufacturer (INAMED, Carpenteria, CA, USA), has a self-locking mechanism, two standard sizes and a 360° inflatable portion which make its application and calibration much easier. At the same time, Roticulator Instruments (AUTOSUTURE) and a lap-band closure tool (INAMED) have appeared on the laparoscopic instrument market. Due to all these technical innovations the laparoscopic positioning of the banding has become not only possible but even easier and surer.

With the experience gained in more than 200 SASGB open procedures, we developed the above described laparoscopic technique.

The seven patients in whom, between September 1993 and February 1994, we laparoscopically applied the lap-band, tolerated the procedure very well. One of the seven patients in the early post-op period, developed increasing and protracted vomiting. Gastroscopy and upper GI series revealed that the upper pouch was enlarged and had obviously slipped through the band. The patient was operated on 2 weeks after the laparoscopic procedure. This kind of stomach herniation was reduced by pulling the gastric walls through the band into a correct position. The band was secured on the anterior surface with more interrupted sutures between the serosa of the stomach just proximal and distal of the band to avoid further slippage. The patient did well afterwards and is fully asymptomatic.

In order to be successful, the laparoscopic technique should follow and respect the main steps of the open operation. Therefore it is particularly important to measure the pouch, to limit the dissection along the lesser and greater curvature and to apply retention sutures.

The mean operative time, which was 2 h, will be reduced to more acceptable levels by improvements in surgical technique as well as by increased experience. With the development of skills it would seem possible to extend this method to most prospective initial banding subjects.

Lap-band appears to be a promising technique because it reduces the perioperative morbidity rate and hospital stay, while the short-term results appear to equal those of the open procedure. This is not unexpected, as the approach differs but not the procedure itself.

This new approach appears to be not only justified but also it can represent a major achievement in bariatric surgery, as it combines the minimal invasiveness of the laparoscopic approach with the reversibility and adjustability of the ASGB.

References

1. Kuzmak L. Gastric banding. In: Deitel M. ed. *Surgery for the Morbidly Obese Patient.* Philadelphia: Lea & Febiger 1989: 225–59.
2. Cadière GB, Bruyns J, Himpens J, *et al.* Laparoscopic gastroplasty. *Br J Surg* 1994; **81**: 1524.
3. Renquist K, NBSR Data Contributors. Surgical treatment of obesity in America: data according to the National Bariatric Surgery Registry. *Problems in General Surgery* 1992; **9**: 231–8.

(Received 10 July 1994; accepted 25 September 1994)