

Adjustable gastric banding for morbid obesity.

Our experience



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BACKGROUND: *The adjustable gastric banding is considered the most common procedure in Europe for the treatment of morbid obesity. We report our experience with this procedure, that was introduced in our Departments of Surgery since 1993.*

METHODS: *From December 1993 to December 2004, 684 morbid obese patients (139 males and 545 females) underwent adjustable gastric banding (AGB) in our departments of Surgery. The first 323 patients were operated with perigastric procedure, the following 361 patients with pars flaccida technique. 601 patients were operated with laparoscopic approach, 83 with open approach. The average follow-up is 5 years.*

RESULTS: *Mean BMI decreased from 42.2 to 34 Kg/m² five years after the operation, with an EWL of 54 %. The main early complications were: intraoperative gastric perforation (5 patients, 1 of which repaired in laparoscopy); hemorrhage from short gastric vessels (3 patient, repaired in laparotomy). The major late complications were: intragastric band migration (7 patients); irreversible dilatation of the gastric pouch (42 patients, treated surgically with band removal or repositioning).*

CONCLUSION: *In our experience laparoscopic adjustable gastric banding is a safe and effective procedure, suitable to most patients, and should be considered as the first choice in the surgical treatment of morbid obesity.*

KEY WORDS: Morbid obesity, Bariatric surgery, Adjustable gastric banding.

Introduction

In a recent study ¹, 9.1% of the Italian population is obese and 33.4% is overweight. We can actually assert that in Italy 4.000.000 people are obese, which means 25% increase over the last seven years. Most associated morbidities and mortality are related to diseases like coronary disease, diabetes mellitus type 2, obstructive sleep apnea, hypertension, dyslipidemia.

Body mass index (BMI) greater than 40, or greater than 35 with co-morbidities, requires a surgical procedure to obtain weight loss if dietetic programs fail. Since 1993 we introduced in our Departments of Surgery the adjustable silicone gastric banding (ASGB), according to Kuzmak's technique 2, for the treatment of morbid obesity.

Materials and methods

Between December 1993 and December 2004, 684 patients (139 males, 545 females) underwent adjustable gastric banding in our Departments of Surgery. Mean age was 39 years (18-65); mean weight was 115 Kg (82-218); mean BMI was 42 kg/m² (35-72). Mean follow-up is 5 years. 83 patients were operated in open sur-

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gery, and 601 with laparoscopic technique (LAGB).

In the open surgery group, 32 patients underwent ASGB in pre-laparoscopic era, 19 were converted to ASGB from previous bariatric surgical operations (7 jejunoileal bypass, 2 biliointestinal bypass, 5 vertical gastroplasties, 3 biliopancreatic diversions, 2 non-adjustable gastric banding); 19 underwent open surgery because of previous abdominal operations; 13 patients underwent conversion from laparoscopy to laparotomy for hepatomegaly (6 cases), or for perioperative complications: 4 patients for gastric perforation, 3 patients for massive bleeding of peri-gastric vessels.

The patients were selected on the basis of the criteria of the American Society for Bariatric Surgery³ by a multi-disciplinary team: internist, bariatric surgeon, dietician, psychologist and psychiatrist. The patients were informed about the follow-up, and in particular about the dietary restrictions and the band adjustments needed to obtain a satisfactory weight loss. The surgical procedure was performed according to the modified technique described by Belachew et al.^{4,5} in the first 323 patients. In the subsequent group of 361 patients, due to the high rate of bleeding and gastric perforations, we abandoned the perigastric procedure and adopted the pars flaccida approach to pass the band, with a technical modification, consisting in a single-stitch suture of the lesser gastric curvature, just below the band, to the right crus. The aim was to stabilize the position of the band and avoid its slippage. This modified procedure appeared to be easier and safer: no more gastric perforations occurred, and pouch dilatations decreased dramatically. The band was left empty at the end of the operation. A gastrografin swallow was performed on the 1st postoperative day, and oral feeding resumed. Patients were discharged on a semiliquid diet of 1000 Kcal/day for one month; then they resumed a solid, slowly-chewed diet. Outpatients follow-up involved a visit with a surgeon and a dietician every other month. The first band adjustment was done during the third postoperative month.

Results

The mean operating time was 150 minutes (range 130-250) in the open group and 75 minutes (range 55-190 minutes) in the laparoscopic group. Mean postoperative hospital stay was 8.2 days (7-15) in the open series and 3.8 days (3-6) in the laparoscopic group.

Figure 1 shows the curve of BMI during a 5-years follow-up. After 5 years the mean weight was 99 Kg, the mean BMI was 34, the mean EWL was 54%. Weight loss was adequate in 96.6% of patients and unsatisfactory (< 25% of the initial weight) in 3.4%. Six women had a regular pregnancy after surgery. One death occurred: a female patient died two years after the operation for perforation of a dilated gastric pouch.

The most important intraoperative complications were gastric perforations, all in the perigastric laparoscopic group (0.7%). The tear was recognized intraoperatively in all patients: four were converted to open surgery, and in one case a laparoscopic gastrorrhaphy was done. In all cases the band was anyway positioned, and no postoperative complications occurred.

Other early complications were: pneumonia in three patients of the open surgery group (0.4%); 2 deep vein thrombosis, one in a poliomyelitic patient (0.3%). Three patients were converted to open surgery for intraoperative hemorrhage.

The major late complications were:

- Intra-gastric band migration in 7 patients (1.1%). The band was removed with gastroscopy (2 patients), open surgery (4 patients), conversion to jejuno-ileal bypass (1 patient).

- Irreversible gastric pouch dilatation in 42 patients (6.1%). However in the group of the modified pars flaccida technique (361 patients) the rate of dilatations was 1.31%.

- 14 patients (2%) had a reversible pouch dilatation, that recovered with conservative treatment.

Port complications, in 47 patients (6.8%), that included:

- port dislocation (rotation) in 3 patients (0.4%): in these patients repositioning was performed under local anesthesia.

- leak of the filling system in 3 patients (0.4%): the port was replaced in all patients.

- port disconnection in 40 patients (5.8%): reconnection was performed in 33 patients patient in local anesthesia; in 7 patients the ruptured tube had slipped in the peritoneal cavity and was retrieved by laparoscopy.

- port infection in one patient: the port was removed and afterwards the patients showed band erosion.

Anorexia occurred in three young female patients (0.4%), who needed band removal.

43 reoperations occurred:

- band repositioning (0.8%) or band removal (4.8%), due to gastric pouch dilatation.

- conversion to other bariatric procedure (0.5%): for pouch dilatation we performed one conversion to silastic ring vertical gastroplasty, and two conversions to biliointestinal bypass; for band erosion in a female patient one conversion to jejunoileal bypass.

Discussion

Laparoscopic adjustable gastric banding (LAGB) is the most commonly performed bariatric operation in Europe⁶. LAGB is attractive because it is minimally invasive, completely reversible and can be adjusted to suit the patient's needs⁷. Medical treatment is not able to obtain significant and sustained weight loss⁸. Therefore, bariatric surgery has become the therapy of choice in morbid obesity. Long-term benefits of bariatric

tric surgery go far beyond the cosmetic appeal of weight loss⁸: nearly all co-morbidities improve or recover after weight loss^{9,10}. To obtain good results, the selection of patients¹¹ and their life-time compliance to dietary restrictions (hypocaloric, slowly-chewed diet) are of outstanding importance.

Major postoperative complications were gastric pouch dilatation (GPD) and band erosion. GPD is the most frequent complication of LAGB, with an incidence of 3-20%¹²: this rate has been reduced creating a "virtual" pouch (< 15cc) above the lesser sac¹³ and a suture-fixation of the anterior wall of the stomach to embed the band completely. With a further suture-fixation of the lesser curvature to the right crus the rate of dilatations in our experience was dramatically reduced⁶.

Food intolerance (pyrosis, gastroesophageal reflux, vomiting) is the first symptom of GPD. In a few cases it can be treated successfully with band deflation, restrictive liquid diet and PPI, or with gastric suction and parenteral nutrition¹⁴. In unresolved cases, patients are scheduled for surgical revision:

- laparoscopic band removal or repositioning.
- conversion to another bariatric operation (vertical banded gastroplasty, gastric bypass, biliopancreatic diversion, biliointestinal bypass).

Precise surgical technique, progressive stoma narrowing by injecting 0.5-1 ml of sterile saline through the port, and alimentary re-education¹⁵ of the patients play moreover a fundamental role in reducing the incidence of GPD.

Intragastric band migration should be considered if the patient regains weight or can eat a solid diet without feeling satiety. The incidence of band migration (~ 1%) could be higher because many cases may not be reported and some occur long time after the operation. The mechanism of erosion¹⁶ could be related to ischemia of the gastric wall due to the pressure caused by the band, or to infec-

tion at the implantation site of the port and ensuing inflammatory reaction, or to inappropriate intraoperative dissection technique. In our series, infection preceded band erosion in two cases; in the third case intragastric migration occurred 40 months after the operation.

In conclusion, we consider LAGB the first choice in the surgical treatment of morbidly obese patients, because it is generally well-tolerated, the weight loss is satisfactory, and the complications are few.

To achieve good results we consider mandatory:

- a very precise surgical technique ("virtual" gastric pouch, suture-fixation to embed the band, keep the band empty at the end of the operation).
- a very close follow-up to recognize promptly pouch dilatations and band erosions.
- a life-time compliance of the patient to the new alimentary behaviour.

Riassunto

OBIETTIVI: il bendaggio gastrico regolabile è il più comune intervento chirurgico per il trattamento dell'obesità grave in Europa. Viene riportata la nostra esperienza con questo tipo di intervento, che viene effettuato nei nostri Dipartimenti di Chirurgia dal 1993.

MATERIALI E METODI: dal Dicembre 1993 al Dicembre 2004 nei nostri Dipartimenti di chirurgia sono stati sottoposti a bendaggio gastrico regolabile 684 pazienti (139 maschi e 545 femmine). I primi 323 pazienti sono stati operati con la tecnica "perigastrica", i successivi 361 pazienti con la tecnica "pars flaccida". È stato utilizzato l'approccio laparotomico in 83 pazienti, e quello laparoscopico in 601 pazienti. Il follow-up medio è di 5 anni. **RISULTATI:** Il BMI medio è calato dopo 5 anni dall'intervento da 42,2 a 34 Kg/m², l' EWL è stato del 54%. Le principali complicazioni precoci sono state: perforazione gastrica intraoperatoria (5 pazienti, di cui 1 riparata in laparoscopia); emorragia dai vasi brevi (3 pazienti, convertiti in laparotomia). Le principali complicazioni tardive sono state: migrazione endogastrica del bendaggio (7 pazienti); dilatazione irreversibile della tasca gastrica (42 pazienti, tutti operati di rimozione o riposizionamento del bendaggio).

CONCLUSIONI: nella nostra esperienza il bendaggio gastrico laparoscopico è una tecnica sicura, efficace e adatta alla maggior parte dei pazienti bariatrici, e può essere considerato l'intervento di prima scelta per il trattamento chirurgico dell'obesità patologica.

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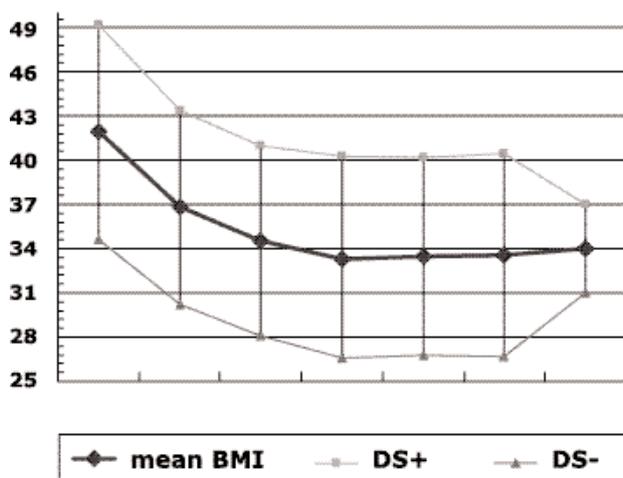


Fig. 1: Curve of BMI during 5-years follow-up.

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