Early Results of Recently Introduced Laparoscopic Adjustable Gastric Banding Procedure for Morbid Obesity in Croatia

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ABSTRACT

Introduction: Morbid obesity is a growing medical problem that has become of epidemic proportions. Various dietary and pharmaceutical approaches do not obtain acceptable long-term results. Surgery, however, especially gastric restriction, represents a viable therapeutic solution. Individuals with a body mass index (BMI) >40 kg/m² or >35 kg/m² with at least one severe comorbidity are considered morbidly obese and generally qualify for weight-loss surgery. Laparoscopic adjustable gastric banding (LAGB) is currently the most commonly performed procedure, because it is minimally invasive, does not cause metabolic complications, is completely reversible, and is adjustable. In Croatia, the first LAGB was performed in May 2004 at Clinical Hospital “Sestre Milosrdnice.” The aim of this report is to illustrate a newly performed surgical treatment and its results for morbid obesity in Croatia.

Methods: Within a 12-month period, the adjustable gastric band was implanted in 15 morbidly obese patients (female, 8; male, 7; mean age, 46.67 years; range, 26–59 years). The so-called “pars flaccida” technique was used.

Results: One operation required conversion to laparotomy due to a gastric lesion, and 1 laparoscopy operation was terminated due to massive postoperative adhesions. The average duration of surgery was 90±30 minutes. Mean length of stay was 4.9 days (range, 3–9). An average BMI at the time of surgery was 52.21 kg/m² (range, 45.29 to 61.59); mean body weight was 155.58 kg (range, 127 to 204). Throughout 1-, 3-, 6-, 9-, and 12-month follow-ups, an average of 18.71%, 25.06%, 34.37%, 41.23%, and 47.32% of excessive weight loss (EWL) was observed. Good tolerance and a low complication rate were noted.

Conclusion: LAGB resulted in good early results and a low complication rate. LAGB appears to be a quality surgical procedure for the management of morbid obesity.

Key Words: Morbid obesity, Laparoscopy, Gastric banding, Weight loss.

INTRODUCTION

Obesity has become a substantial medical problem in the developed world. Excess weight is linked to an increased risk of cardiovascular diseases, hypertension, diabetes, asthma, sleep apnea, depression, infertility, osteoarthritis, and gastroesophageal reflux. Weight loss has been shown to improve these comorbid conditions. Obesity is described as a body mass index (BMI) of >30 kg/m², and it has evolved in some countries into an epidemic problem. However, there is particular medical concern with morbid obesity (BMI >40) and super obesity (BMI >50), which result in serious morbid conditions.

Various dietary and pharmaceutical therapeutic approaches have not obtained acceptable long-term results. Surgery represents the only effective therapeutic solution that has been proven to consistently achieve long-term reduction of excess weight. Gastric restriction is a treatment option for morbid obesity. Among surgical methods, laparoscopic adjustable gastric banding (LAGB) currently represents the most commonly performed procedure. More than 150,000 implanted gastric band devices have been implanted worldwide so far. LAGB is the most commonly performed procedure, because it is minimally invasive, does not cause metabolic complications, is completely reversible, and offers individual postoperative adjustability of restriction.

Based on previous laparoscopic experiences and additional training (in Israel and Austria), in May 2004, we performed the first LAGB in Croatia. Since then, 12-month and extended follow-up results have been obtained. This report describes our early experience with this new treatment method for surgical obesity in Croatia.
METHODS
Between May 2004 and May 2005, 15 patients underwent LAGB placement by a single surgeon (Bekavac-Beslin M). All procedures, hospital stay, and prospective follow-up were performed at our facilities in the Clinical Hospital, “Sestre Milosrdnice,” in Zagreb. All patients were required to meet morbid obesity surgical criteria (BMI > 40 or > 35 with a comorbid condition). Because of our initial experience, some additional criteria were developed (age between 18 and 55, stable obesity for more than 5 years, failure of conservative therapy, absence of glandular diseases, and no alcohol or drug dependency). Preoperatively, all patients were informed about the procedure, screened medically, and underwent psychological assessment.

Eight women and 7 men were included, and the mean age was 46 (range, 26 to 59 years). The mean preoperative body weight was 155.58 kg (range, 127 kg to 204 kg). Initial BMI was 52 kg/m² (range, 45.29 to 61.59).

Laparoscopy using three 5-mm and one 10-mm port with the patient in the French position and the surgeon between the patient’s legs was utilized. All gastric bands were placed using the so-called “pars flaccida” technique. Briefly, it is a method to gain access to the posterior aspect of the gastroesophageal junction in order to encircle the upper stomach circumferentially. This technique requires minimal gastric dissection, maintains normal gastric anatomy, and avoids disruption of the lesser sac (important for the prevention of gastric prolapse known as a “slipped band”). The band is not filled initially and is secured in place with anterior gastro-gastric fundoplication. Tubing to the band is connected to a reservoir port that is secured to the anterior rectus sheath in a midabdominal location.

Postoperatively, elective barium swallow was performed to confirm correct positioning and patency, depending on band overtightening. Patients were then discharged on a liquid/soft diet for 4 weeks. Initial filling of the band began at 6 weeks and then was subsequently adjusted depending on weight loss and satiety. Additional follow-up periods were conducted at 1, 3, 6, 9, and 12 months postoperatively.

Follow-up included monitoring of patients’ progress and possible complications along with nutritional guidance. Weight, height, BMI (ratio between weight and height squared – kg/m²), excessive weight loss (EWL) (proportion of weight loss and excessive weight over ideal BMI of 25%), and complications were noted. All data were collected prospectively in an electronic database and collated.

RESULTS
Average BMI at the time of operation was 52.21 kg/m² with an average body weight of 155.58 kg. The mean operative time was 90 ± 30 minutes. Mean hospital stay was 4.9 days (range, 3 to 9).

One operation required conversion to laparotomy due to an accidental gastric incision. In the same patient, a ventral hernia was observed postoperatively. Early complications included one incidence of postoperative vomiting, and one patient complained of postoperative discomfort. Late complications included one bolus-obstructed pouch that was easily removed gastroscopically, and vomiting was noted in 2 patients. These few complications did not compromise follow-up visits. Generally, all other patients did not complain of postoperative discomfort. Mostly, patients felt motivated to continue with follow-up assessments and recommended behavioral changes. Patients could attend follow-up visits at slightly different times from those scheduled, but not more than a week difference, and only when they had a valid reason for requesting the different time.

Good postoperative weight loss was achieved. After 12 months, mean body weight was 120 kg, and weight loss compared with preoperative values was 35 kg (Figure 1). Initial BMI of 52 decreased continuously to 47, 46, 43, 42, and 39 at 1, 3, 6, 9, and 12 months, respectively (Figure 2). Because of insufficient data for adequate statistical
analysis, only mean values along with min/max values were emphasized.

An average excess weight loss (%EWL; based on ideal BMI of 25 kg/m²) at assessed intervals of 19%, 25%, 34%, 42%, and 49%, respectively, was achieved (Figure 3).

**DISCUSSION**

According to the literature,7,9–13,19 gastric restriction methods, especially laparoscopic techniques for gastric banding, are currently the most commonly performed procedures for treating morbid obesity. The LAGB procedure has excellent advantages. It is minimally invasive, fully reversible, individually adjustable, and has a low complication rate. It has long-term safety and efficacy.5,18,20,21 Some early and late postoperative band-associated complications were gradually reduced after reducing the pouch size22 and adopting the pars flaccida technique.23 We performed all of our implantations by using these techniques. No major band complications occurred in our patients. In spite of the benefits of this technique, we noted some late complications, such as vomiting and bolus-obstructed pouch. A great deal of experience is required to perfectly coordinate band filling and patient’s satiety to minimize possible complications. Additionally, enormous individual effort along with supportive guidance in behavioral and nutritional changes should be provided.

Our early results coincide with those of the many published series.9–12,18–19,24,25 We had relatively high initial BMI of 52 kg/m² (international data18 typically 45 kg/m²). As described in the literature,9–10,12,18,25,31–35 an average 12-month reduction in BMI of 9 kg/m² to 13 kg/m² was observed (Table 1). Our results are similar. Furthermore, Ren18 reported a 45% EWL 1 year after LAGB, Langer12 49% EWL, Rubenstein25 38% EWL, and other authors24,26,32–35 reported analogous results. Our 48% EWL at 12 months although recorded in a small group is strongly encouraging. Langer12 reported a 13% incidence of banding failure (defined as EWL <20% over the first year). Additionally, he noted a remarkably wide range of EWL after 2 years. A possible explanation might be lack of patient compliance with scheduled outpatient visits and band adjustments.12 Relatively consistent values in our report are likely due to the good preoperative candidate

**Table 1.**

Initial and 1-Year Body Mass Index Values in Several Studies Reported in Recent Publications

| Author                | Journal Volume      | Body Mass Index (Initial to 1 year) |
|-----------------------|---------------------|-------------------------------------|
| Fielding GA (Aus)19   | Surg Endosc 13 (1999) | 47 to 34                             |
| Abu-Abeid S (Isr)31   | Obes Surg 9 (1999)   | 43 to 32                             |
| Belachew M (Bel)26    | Obes Surg 12 (2002)  | 42 to 32                             |
| Angrisani L (Ita)32   | Surg Endosc 17 (2003)| 43 to 33                             |
| Zinzindohue F (Fra)33 | Ann Surg 237 (2003)  | 43 to 34                             |
| Coskun H (Tur)34      | Obes Surg 13 (2003)  | 45 to 35                             |
| Holloway JA (USA)35   | Am J Surg 188 (2004) | 49 to 36                             |
| Ren CJ (USA)18        | Surg Endosc 18 (2004)| 52 to 39                             |
| Spivak H (USA)9       | Am J Surg 189 (2005)| 45 to 37                             |
criteria as described. Further similar patient selection should provide promising results.

Some recent publications reveal LAGB to be an effective treatment in weight reduction long-term. Compared with vertical banded gastroplasty (VBG) and Roux-en-Y gastric bypass (RYGB) LAGB achieved similar long-term results with fewer complications and better cosmesis.

Nonetheless, some aspects of this treatment should be elucidated. Only well-experienced and adequately trained surgeons will avoid potential operative failures. We stress retro gastric tunneling as a key point of the procedure. Gastric fundus or cardia lesions can be due to the routinely used rigid instruments (GoldFinger, Obtech Medical AG, Switzerland) to gain the posterior aspect of the gastroesophageal junction. Proper technique is essential. If a serious gastric lesion is identified, it should be removed with laparotomy.

Highly successful results depend mainly on good preoperative patient screening, well-organized patient guidance, and patient persistence. An individual approach and a great deal of experience are required to determine when the band needs to be tightened or loosened. Excess tightness leads to protracted restriction complications and excess looseness leads to ineffectiveness of the procedure.

**CONCLUSION**

Following modern surgical principles, we performed and reported our first implantations of the adjustable gastric band by using the laparoscopic pars flaccida technique. Although further procedures are needed to collect sufficient data, some conclusions can be anticipated.

Our early experience clearly follows the reports in the literature. A lack of major postoperative complications confirms the described method as reliable for treating morbid obesity. Apart from its safety, we agree that the main LAGB benefits are its adjustability and reversibility according to an individual’s motivation and satiety. A more rapid recovery and reduced hospital stay are further benefits of this treatment option.

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