

Ten-Year Weight Loss Evaluation After Adjustable Gastric Banding in Severely and Morbidly Obese Patients

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ABSTRACT

Obesity is a major problem of healthcare systems in occidental countries. Adjustable gastric banding is a surgical technique used in France. There are few studies reporting the performance of this procedure in the long-term (more than 10 years). We evaluated the long-term results of this technique on excess weight loss (EWL) in a unicenter retrospective study. Ninety-seven patients undergoing an adjustable gastric banding procedure in our center from 1999 to 2003 were included. The mean age was 35 ± 9 years. There were 90 female and 7 male patients. The pre-operative mean Body Mass Index (BMI) was 43.02 ± 5.7 kg/m². After surgery, the BMI decreased progressively to reach its minimal value at 22 months, with a mean of 32.96 ± 7.4 kg/m². At 10 years, the BMI increases progressively to achieve a mean of 36.75 ± 7.42 kg/m². The rate of banding removal was 35%, follow-up – 73%. Our analysis could not identify a factor that was able to predict success or failure. Better selection criteria and rapid tactic changes (revisional procedures) in cases of insufficient weight loss could improve the performance of this surgical technique.

Key words: Gastric banding; Long-term follow-up; Excess weight loss

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INTRODUCTION

In 2012, 33.2 % of adults in France were overweight ($25 \leq \text{BMI} < 30$ kg/m²) and 15% were obese ($\text{BMI} \geq 30$ kg/m²)^[1]. Obesity is directly responsible for 7 to 41 % of cancer cases, 44 % of diabetes cases and of one-fifth of myocardial infarction cases^[2]. Medical treatment of obesity is not effective in long-term studies^[3]. Three main surgical techniques are practiced in France – adjustable gastric banding (AGB), sleeve-gastrectomy and gastric bypass. The technique of adjustable gastric banding was first described by Kuzmak *et al* in 1990^[4] and has been practiced in Martinique University Hospital since 1999.

This is a restrictive laparoscopic technique, reducing the volume of functional stomach. The drawing of AGB procedure is shown in figure 1.

The majority of studies evaluating the results of this technique were limited by a short period of survey – 3 to 5 years. The primary endpoint in our study was an excess weight loss (EWL) evaluation at 10 years after the AGB. We analyzed these data to propose “measures to take” in cases of failure.

MATERIALS AND METHODS

A total number of 97 patients undergoing an AGB procedure in our center from 1999 to 2003 (first experience) were included in this study. The inclusion criteria were HAS (High Health Authority) bariatric surgery indications^[5] – patient with $35 < \text{BMI} < 40$ kg/m² and comorbidities or patients with $\text{BMI} > 40$ kg/m² without comorbidities. These data were collected retrospectively either by consulting a personal file with a recent consultation in an out-patient department or by telephone.

The results were presented as the mean \pm standard deviation. The Kaplan-Meier method was used to represent time-to-event information (AGB removal), and a scatter plot was used to represent BMI evolution. Univariate analyses were performed to identify the predictive factors of success and of AGB removal. The R free software (R Project for Statistical Computing) was used for the statistical analysis.

RESULTS

Seven males and 90 females were included in this retrospective cohort study, with a mean initial body mass index of $43.02 \pm 5.7 \text{ kg/m}^2$ and mean age of 35 ± 9 years. Before the surgery, 27% of patients have been treated for the arterial hypertension. Information about others comorbidities (type II diabetes, sleep apnea, osteoarthritis) was not collected systematically. At 10 years, the gastric band was removed in 34 patients (35%, comparable to other studies^[6,7]), as shown in figure 2.

Twenty-six patients were lost from the survey (73% of follow-up, comparable to other long term studies^[8]). The mean survey time was 82 ± 49 months. The initial, minimal and final BMI for all patients are represented in figure 3. This scatter plot with a smooth curve fitted by Loess describes the tendency after surgery, in which the BMI decreases initially to achieve a minimum of $32.96 \pm 7.4 \text{ kg/m}^2$, corresponding to a mean of $48 \pm 24\%$ of EWL at 22 ± 21 months. Later, we observed a progressive BMI increase to reach a mean of $36.75 \pm 7.42 \text{ kg/m}^2$, which corresponded to $32 \pm 24\%$ of EWL at 10 years. At the end of this period, 22% (8/37) of patients who were still participating in the survey had a good result - $\text{EWL} > 50\%$ according to the criteria of Reinhold^[9]; 38% (14/37) had an intermediate result - $25\% < \text{EWL} < 50\%$; and 40% indicated failure - $\text{EWL} < 25\%$. The re-intervention rate, with all types of surgery included, was 58% (56 of 97 patients) at the end of the period of the survey.

Age, sex, height, weight and initial BMI were tested in univariate analyses to identify the factors of success ($\text{EWL} > 50\%$) or of band removal. First, we calculated Fisher or chi-2 test for each variable. Then a logistic regression analysis was performed. We evaluated the whole cohort of patients, including those with more than 10 years of surveillance, those with more than 5 years and those with more than 2 years of surveillance. We also analyzed the influence of time in logistic regression. We did not perform multivariate analysis as there was no statistically different result ($p > 0.05$) for any variable.

DISCUSSION

Our study has some limitations, including its retrospective type, data from the same group of patients were compared at different periods of time, method of information collection and low number of patients. The last factor is explained by the relatively recent introduction of this technique and our desire to examine the results of this surgery after 10 years of survey. Our findings were consistent with those obtained in other studies describing a long-term survey after AGB. Thus, at 10 years, the mean EWL is 32% in our study, while other studies demonstrated better results at long-term with a mean EWL from 40 to 50%^[10,11,12]. The initial weight loss (48% in our study) was comparable to other studies^[13], as its subsequent ascension is well known^[14,15]. Our re-intervention rate of 58% was also comparable to the rate of 50-60% observed in other long-term studies^[16,17], and the percentage of band removal (35%) was comparable to the 7-51% observed in previous studies^[17,18]. High re-intervention rate can be explained partially by the “perigastric” positioning technique which

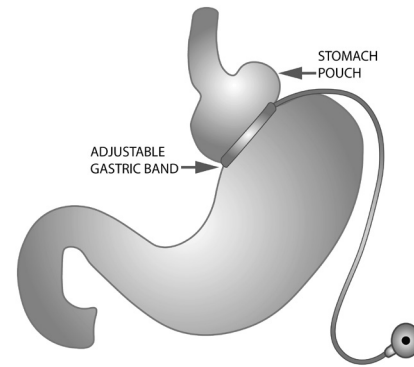


Figure 1 AGB procedure schema.

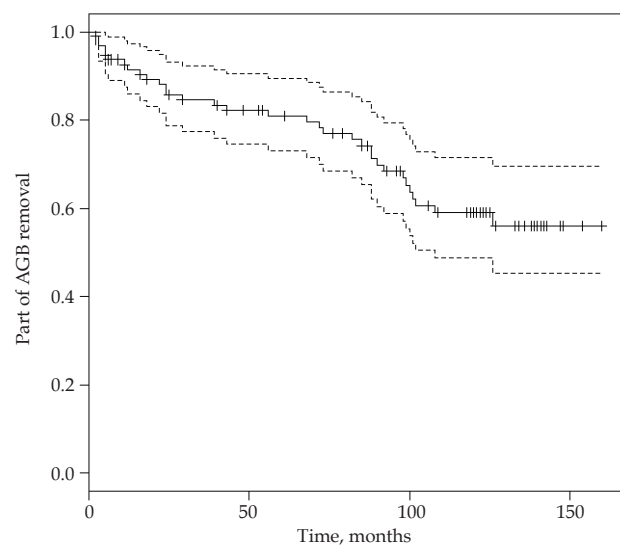


Figure 2 Incidence of AGB removal. Solid line represents the Kaplan-Meier estimates, and dashed lines represent 95% confidence intervals.

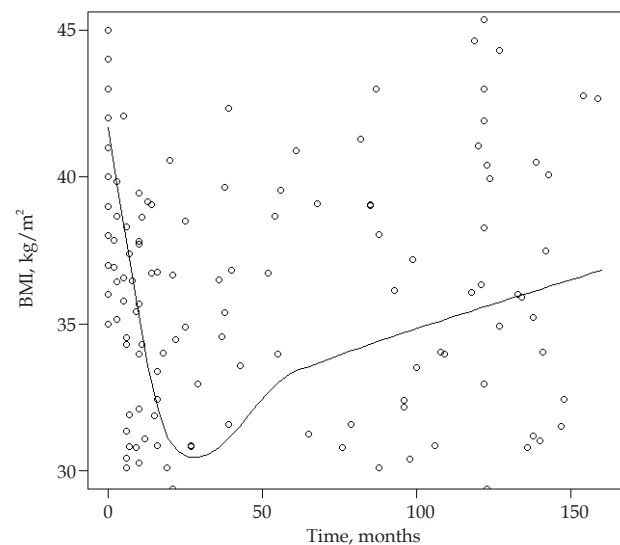


Figure 3 Schematic BMI evolution during the 10-year survey. Solid line represents mean BMI.

was used initially and was subsequently replaced by “pars flaccida” technique. The mean delay of maximal EWL in our study was 22 ± 21 months. Extrapolating this to our population, we propose an alternative surgical technique for non-responders, i.e., with an EWL less than 25% at 43 months after gastric banding.

The second way to improve our results is through a better selection of patients for this specific procedure. Our analysis could not identify any factor that was able to predict success or failure. This finding may be due to the low study power. However, other authors^[6,18] presumed that patients with an initial IMC < 50 and age < 40 are better candidates for AGB.

CONCLUSIONS

The advantages of this minimally invasive technique are simplicity, adjustability, reversibility and good short-term results. The major drawbacks are necessity for strict postoperative follow-up and diet and presence of implant with potential for implant-associated issues in the future as well as less favorable results in comparison with other surgical procedures.

At 10 years, only one-fifth of patients in our cohort had good result in terms EWL. In one-third of cases, the AGB was removed, and in two-thirds of patients, we performed a re-operation. Better selection criteria and a rapid tactic change (revisonal procedures) in cases of insufficient weight loss could improve the performance of this technique

CONFLICT OF INTERESTS

There are no conflicts of interest with regard to the present study.

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