

Laparoscopic Adjustable Gastric Banding is a Safe and Effective Treatment for Morbid Obesity

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ABSTRACT

Objective: Surgery has been recognized as an effective long-term treatment for morbid obesity. The purpose of this study is to present our experience of laparoscopic adjustable gastric banding (LAGB) as a safe and effective treatment for morbid obesity.

Methods and Procedures: Over eight months, 39 morbidly obese patients, having a Body Mass Index (BMI) >40 kg/m², were included in this study. Conservative measures failed to maintain weight loss in all patients. The procedure is performed through a 5-trocar technique. The procedure involves gastric partitioning and stoma formation by an inflatable band. The stoma can be adjusted by injection of saline in the band reservoir.

Results: The mean age of the patients was 31.3 years. The mean BMI was 44.2 Kg/m². All procedures were completed laparoscopically. The mean hospital stay was 2.7 days. The morbidity rate was 15.32%. Patients were followed up for a mean period of 6.7 months. The mean BMI after six months (in 28 patients) was 36.6 Kg/m².

Conclusion: Laparoscopic insertion of the adjustable gastric banding is a safe and effective method for the treatment of morbid obesity and should be the standard way of band insertion.

Key Words: Morbid obesity, Gastric band, Laparoscopy.

INTRODUCTION

Obesity is associated with a great variety of diseases, most notably affecting the cardiovascular system.¹ Various indices are used to quantify obesity—the most commonly used one is the Body Mass Index (BMI). It calculates the body weight in kilograms in relation to the height in meters squared [i.e., BMI = **Weight** (kg) / **Height** (m²)].

The ideal body weight is represented by BMI of 20-25, while a BMI of > 40kg/m² points to a morbidly obese person.

Medical treatment in the form of diet and exercise fails to produce long-term loss of weight in some 90% of morbidly obese patients. On the other hand, various surgical procedures designed to treat morbid obesity showed a successful long-term outcome.²⁻⁵

The silicone gastric band was introduced by Kuzmac^{6,7} in 1983 and in several reports showed to be as effective as the other procedures entailing gastric partitioning and stoma formation (such as Vertical banded gastroplasty) or gastric bypass, with fewer side effects.⁸

The introduction of laparoscopy revolutionized surgical practice, and in morbidly obese patients laparoscopic procedures, such as cholecystectomy, proved to be far less complicating than conventional surgery. Patients enjoy a shorter hospital stay, lesser incidence of wound sepsis and fewer incisional hernias. The aim of this work is to present our experience with the laparoscopic application of adjustable gastric band and its outcome.

PATIENTS AND METHODS

This study involved 39 patients (26 females, 13 males)—all were morbidly obese, with BMI > 40 kg/m². Conventional dieting and exercise failed to maintain weight loss in all patients. Hormonal assays were performed to exclude endocrine disturbances in suspected cases. All patients were assessed by a psychiatrist and only those approved were offered the procedure. Patients were informed about the nature and the hazards of the procedure. They were told about the postoperative course and the need for regular follow up.

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All procedures were performed by the same team. The operative layout is shown in **Figure 1**. The patient is positioned in a head-up position. The procedure was performed through a 5-trocar technique (**Figure 2**). A sixth trocar was used in two patients for traction of enormous greater omentum.

The procedure involves gastric partitioning with an inflatable gastric band (**Figures 3 & 4**). The band is primarily inserted empty to avoid excessive narrowing of the stoma. Prior to dissection, the proximal gastric pouch is sized 15 ml by a special calibrating tube. A window is opened in the lesser omentum and the retro-gastric space is dissected to accommodate the band. Before closure of the band, the stoma size is adjusted by an electronic device attached to the calibrating tube. The band is fixed in place by a series of inverting non-absorbable sutures. At the completion of the procedure, a specially designed reservoir is inserted deep to the left anterior rectus sheath. Drainage is not needed in this operation. Two patients had symptomatic gallstones, and cholecystectomy was successfully performed immediately after band insertion. Patients were allowed oral fluids at the night of the operation and were discharged shortly after the procedure. Weight loss is assessed at monthly intervals for six months and then bimonthly for the same period. At the first visit, a gastric series was performed to assess the size of the stoma and the size of the proximal gastric pouch (**Figure 5**). If necessary, the stoma is adjusted by injection (or withdrawal) of saline from the reservoir by a special non-coring needle, under fluoroscopic control. Injection is done as an outpatient pro-

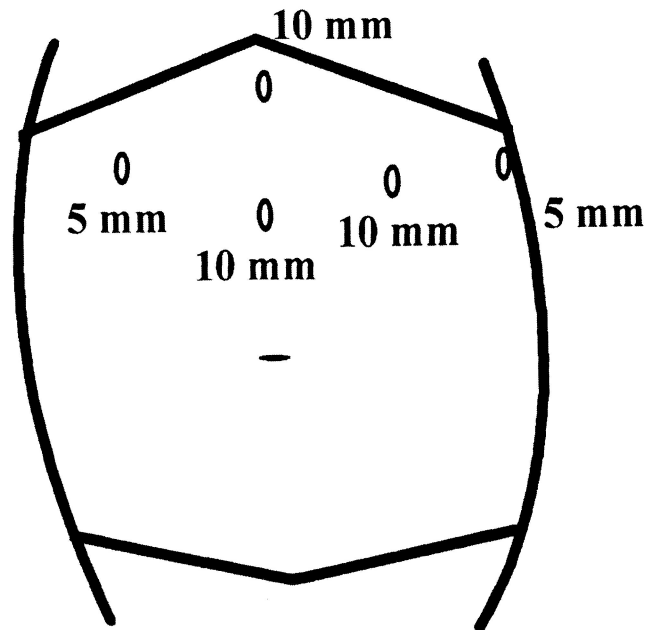


Figure 2. The port sites.

cedure. Injection of 0.4 ml saline narrows the stoma by 0.5 mm, approximately. Injection is indicated when the patient can swallow his regular meal at frequent intervals or if the weight loss is inadequate on repeated visits.

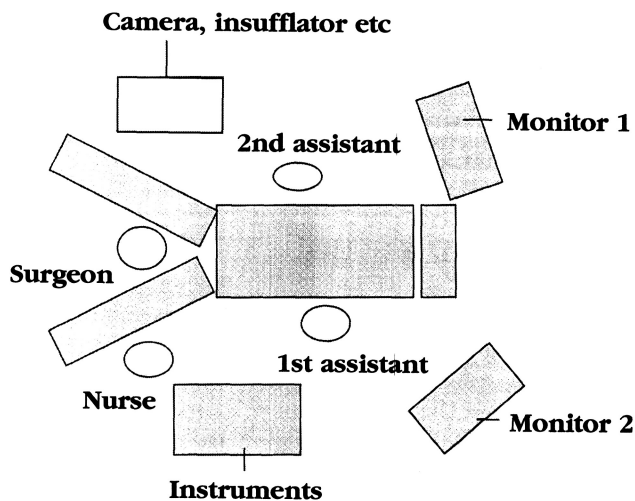


Figure 1. Operative Layout.

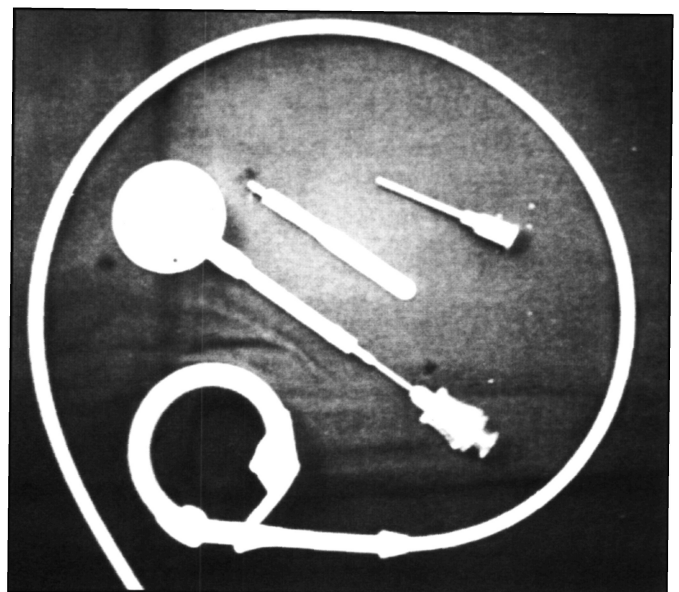


Figure 3. The band with its reservoir.



Figure 4. The band applied around the fundus.

RESULTS

The mean age of the patients was 31.3 years (range 16-49). The mean BMI was 44.2 Kg/m². All procedures were completed laparoscopically. The conversion rate is 0%. The mean operative time was 152 minutes (range 75-300). Two patients had a small hiatus hernia which made the band insertion more difficult but still successful. The morbidity rate was 15.32% (6/39) and there was no mortality in this series.

Thirty-three patients needed band adjustment over the follow-up period. There were 52 injections and only one deflation done. Nineteen patients needed inflation only once, while in nine patients inflation was done twice. In the remaining five patients, the band was injected with saline three times. One patient from this last group needed deflation when she suffered from repeated vomiting after the last injection. A gastric series confirmed the tight stoma and showed the improvement after deflation of the band. Vomiting rapidly disappeared afterwards.

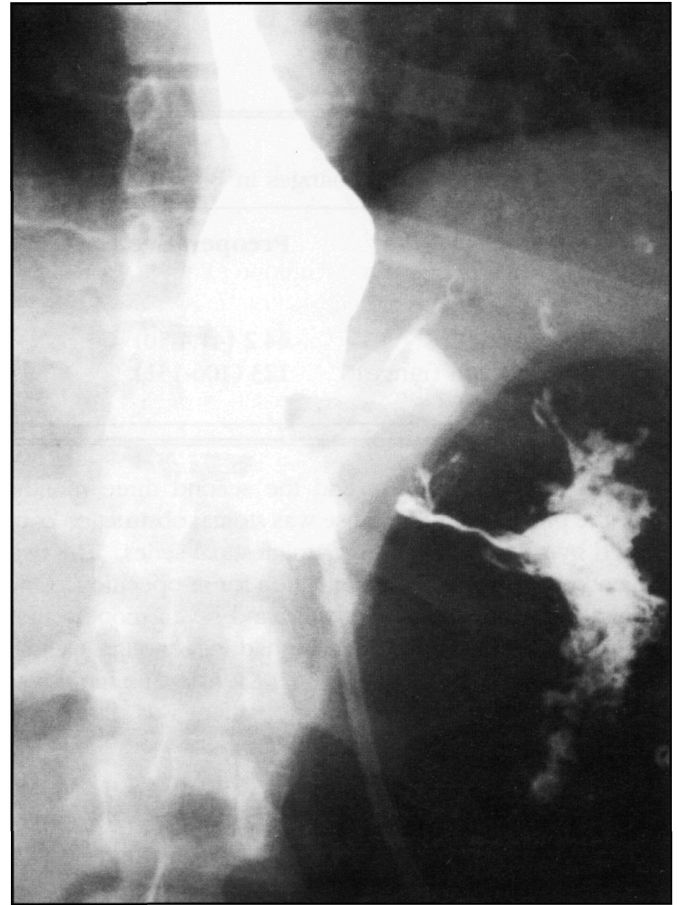


Figure 5. The proximal pouch in a gastric study.

The mean hospital stay was 2.7 days (range 2-7). **Table 1** shows the early and late complications encountered in this series. The patient who suffered from pulmonary embolism stayed in the hospital for seven days. The mean follow-up period was 6.7 months (range 2-10). One patient failed to show up for follow-up seven months after the procedure.

Table 2 summarizes the changes in BMI three and six months after the procedure. Twenty-eight patients were valid for evaluation after six months.

In two patients the band had to be unlocked, one in the

Table 1.
Perioperative and Postoperative Complications.

Morbidity	Number (%)	Outcome
Pulmonary embolism	1 (2.56)	Treated by anticoagulants
Wound sepsis	2 (5.10)	Treated conservatively
Stoma obstruction	2 (5.10)	Band unlocked
Port incisional hernia	1 (2.56)	Repaired successfully
Total	6 (15.32)	

Table 2.
Changes in Body Mass Index [BMI(Kg/m²)] and Body weight (Kg)

	Preoperatively	3 months (36 patients)	6 months (28 patients)
Mean BMI (range)	44.2 (41.4-50)	40.4 (36.4-46.8)	36.6 (33.6-41.5)
Mean Body Weight (range)	123 (106-151)	113.2 (97-140)	101.8 (91-124)

second postoperative day and the second three months after the procedure. The cause was stomal obstruction confirmed by gastroscopy and gastrointestinal series. The two patients are scheduled for evaluation for re-operation. One patient asked for removal of the band seven months after the procedure because he felt he had lost enough weight. His BMI reduced from 44.8 to 36.9 Kg/m². The band was removed laparoscopically, and the patient was discharged from the hospital on the same day.

DISCUSSION

Dieting and exercise are the safest methods for weight reduction. Yet, these measures are unable to sustain weight loss in morbidly obese patients. On the other hand, surgery has proven to be a successful long-term remedy for morbidly obese and superobese patients.

Vertical banded gastroplasty is considered by many as the favorable procedure for weight reduction. It does have its side effects. An obvious disadvantage is that it entails gastric stapling and cutting and hence is not completely reversible.^{2,8,9}

The introduction of the silicone gastric band by Kuzmac in 1983 was warmly received by many of those involved in obesity surgery. The reported morbidity, mortality and efficacy compares well to vertical banded gastroplasty.^{7,10} It has the advantage of simplicity as it creates a small gastric pouch and a narrow stoma in one step. Following the successful use of laparoscopy in many surgical procedures, a few reports showed successful use of laparoscopy in inserting the band¹¹⁻¹³ and in performing vertical banded gastroplasty.^{14,15}

In our study, laparoscopic insertion was successful in all attempted patients. The presence of a small sliding hiatus hernia is not a contraindication, but it adds to the difficulty of the procedure. The patients stayed in the hospital for a short mean period of 2.7 days. The cosmetic appearance of postoperative scars was excellent in all patients. Patients started to lose weight rapidly.

Many of the problems in vertical banded gastroplasty is stoma-related.¹⁶ In our study, adjustment of the size of the stoma is easily done as an outpatient procedure. The number of injections needed varies in different patients and it should be individualized. One should not hesitate to deflate the band if the patient starts to suffer from repeated vomiting.

The laparoscopic approach yields results that are comparable to the open approach for insertion of the adjustable gastric band.^{7,10} The morbidity rate is lesser, particularly respiratory and wound complications. The cosmetic result is far better than the open approach. Patients return to their full activity earlier. Though the number of patients in this series is small, and the follow-up period is short, we believe, guided by our early results, that the laparoscopic insertion of the gastric band should be the routine way of insertion. The procedure needs fine laparoscopic skills and is best suited for the experienced laparoscopic surgeon. Patients seem to enjoy all the benefits of laparoscopic surgery. Proper patient selection is essential as regular follow-up is needed. Despite the potential risk of cholecystitis after weight reduction, we do not feel that prophylactic cholecystectomy should be routinely performed in these patients as it adds to the length and risks of an already demanding procedure. Moreover, the port sites are not optimally placed for laparoscopic cholecystectomy. Our policy is to remove only symptomatic gallstones.

CONCLUSION

Adjustable gastric banding is a recognized successful mean for weight reduction. It is completely reversible as it does not entail gastric stapling, cutting or bypass. In a single step it creates a small gastric pouch and a new "controllable" stoma. Its application through the laparoscopic approach is feasible and safe. It adds to its advantages and deserves to be the standard technique.

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