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Research Article

Sasi vs Sleeve after Failed Intra Gastric Balloon: Our Initial Experience

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ABSTRACT

Introduction: In the last decade some endoscopic bariatric maneuvers i.e. intragastric balloons, gastroplasty techniques, aspiration therapy, and gastrointestinal bypass sleeves intragastric balloon appear as safe efficient less invasive tool for the treatment of obesity.

However due to the high incidence of weight regain unsatisfactory weight loss after IGB, or its associated complications i.e. GERD, gastric ulcers, and balloon migration, the need for bariatric surgery are increased after IGB. In this study, we are aiming to evaluate the surgical outcome of LSG In comparison to SASI after failed IGB as regard BMI changes and postoperative complications.

Patients and Methods: Forty patients (25 females and 15 males) complaining from weight regain or unsatisfactory weight loss after IGB with a mean age of 28.2 years and an average BMI of 45.7 kg/m^2 were enrolled in this study.

Results: One year after the operation, there was a significant difference between both procedures in weight loss in which the postoperative mean BMI of cases converted into SASI (26.3 kg/m^2) and that of cases converted into sleeve gastrectomy (31.4 kg/m^2), this difference can be explained by the malabsorptive power of SASI. After SASI no leakage occurred and only one case suffered from reflux. On the other hand, there was one case of leakage and one case of reflux occurred after LSG.

Conclusion: IGB is a foreign body inside the stomach, it makes marked adhesion between the stomach and pancreas. Its restrictive nature increases the incidence of postoperative complications and poor weight loss if followed by LSG, on the other hand, SASI is a safe and feasible bariatric surgery after the failed balloon. It can achieve early weight loss with minimal post-operative complications.

Keywords: Single anastomosis sleeve ileal bypass; Obesity; Intragastric balloons; Bariatric surgery; Postoperative complications

INTRODUCTION

Due to the worldwide increase of obesity in the last decades, there is a marked rise in the incidence of metabolic diseases i.e. D.M, hypertension, stroke, coronary heart disease. Bariatric surgery proved to be an efficient way for the treatment of obesity and its related comorbidities. But due to its complications, the less invasive method is needed for the treatment of obesity [1].

In the last decade some endoscopic bariatric maneuvers i.e. intragastric balloons, gastroplasty techniques, and aspiration therapy appeared as safe, efficient, and less invasive tools for the treatment of obesity [2].

The idea of Intragastric balloons depends on implanting balloon inside the stomach by endoscopy to act as space-occupying mass which helps in early satiety sensation [3].

In a study done by Busetto et al., they stated that IGB before bariatric surgery decreased the risk of conversion to open surgery and the risk of intraoperative complications in superobese patients [4].

However, due to high incidence of weight, regain or unsatisfactory weight loss after IGB, or its associated complications i.e. GERD, gastric ulcers, and balloon migration, the need for bariatric surgery is increased after IGB [5].

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Laparoscopic Sleeve Gastrectomy (LSG) is nowadays one of the most popular and effective restrictive bariatric surgeries. However, in the long term, it proved to be associated with a high incidence of weight regain and increased incidence of Gastroesophageal Reflux Disease (GERD) [6].

Single Anastomosis Sleeve Ileal bypass (SASI) proved to be golden growing malabsorptive bariatric surgery due to its simplicity and efficiency in comparison to other malabsorptive surgeries, with minimal postoperative complications. It is based on Santoro's operation in which sleeve gastrectomy is performed first followed by gastroileal loop anastomosis in the antrum. By this technique, there is a malabsorptive effect for loss of weight without exclusion for any part of GIT [7].

In this study, we are aiming to evaluate the surgical outcome of LSG In comparison to SASI after failed IGB as regard BMI changes and postoperative complications.

MATERIALS AND METHODS

Patient's selection

This prospective randomised study included forty patients with failed IGB. They underwent bariatric surgery (LSG, SASI) 20 cases for each procedure. The study was conducted from March 2017 to March 2019 at Ain Shams University hospitals after approval of the ethical committee.

Patients with a BMI greater than 40 kg/m^2 and complaining from weight regain or unsatisfactory weight loss after IGB were included in this study. The balloon should be removed for more than 6 months before the operation. Patients were excluded from this study if they had a history of personality disorder, diabetes type I, drug or alcohol addiction, recent cardiac attack, advanced malignancy or had previous bariatric surgery.

A preoperative detailed history was obtained, physical examination, Blood tests, Pelvic abdominal ultrasound, Chest x-ray, Echo, Pulmonary function test, and Upper GI endoscopy.

Singled consent containing all the details of surgical techniques and its complications is obtained from all patients.

Surgical technique

Operations were done under general anesthesia. Prophylactic doses antibiotics was administrated on induction. Patients were positioned with legs apart in anti-Trendelenburg position, five tracers were used and placed as follows: camera tracer (10 mm), handbreadth below the xyphoid process, a 12 mm tracer on the left midclavicular line between the first and the second tracers, a 12 mm tracer on the right midclavicular line, 5 mm tracer on right anterior axillary line and a 5 mm tracer placed below xiphisternum for liver retraction. After oral Ryle insertion dissection was started on the greater curvature 3 cm-5 cm from the pylorus up to the cardio-oesophageal junction until full mobilization of the gastric fundus was achieved. Careful dissection of adhesions between the pancreas and the posterior wall of the stomach (which is very common with IGB) is done to avoid injury of major vessels. After detaching the stomach from the great curvature, a 40-French orogastric tube was inserted in the stomach and into the duodenum. Stomach resection was done by using linear staplers that were applied parallel to the lesser curve starting 5 cm from the pylorus up to the angle of Hiss (Figure 1).

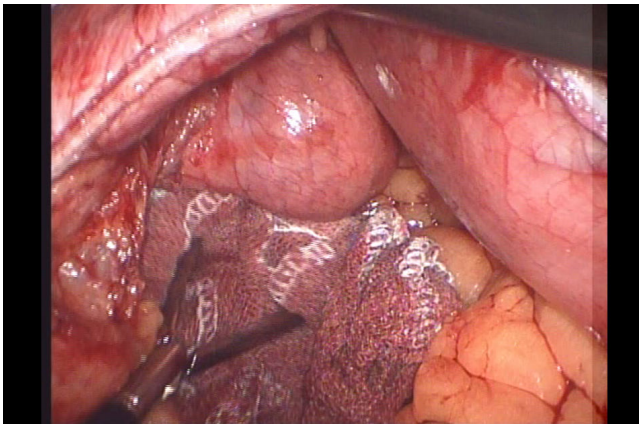

Figure 1: large size sagging fundus should be excluded.

In cases that underwent SASI same steps of LSG were performed in addition to the following after the creation of the sleeved gastric tube, the patient's position was changed to Trendelenburg position. Then retracting transverse mesocolon toward the head of the patient and 300 cm of jejunum was measured from the ileocecal junction then an ante colic side to side gastro-jejunostomy at the posterior wall of the area between antrum and body of the stomach was performed with 45 mm linear stapler (Figures 2 and 3).

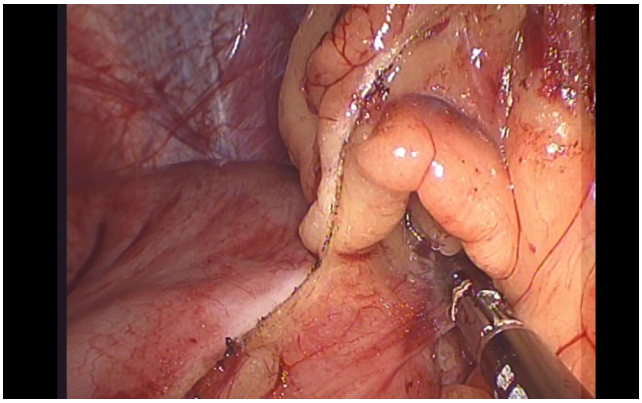

Figure 2: Carful adhesiolysis for posterior adhesion.

The stapler gastroentrotomy was closed with a Vicryl 2/0 continuous stitch. A nasogastric tube was placed in the gastric pouch and the resected stomach was then removed through the left midclavicular port. Therefore, the operation ended with a gastric tube having two outlets; one to the duodenum and one to ileum.

A leak test was performed twice by methylene blue. Nelaton drain was then placed. Patients were kept on NPO for 24 hours and on intravenous fluids, antibiotics, analgesics, proton pump inhibitor, and anticoagulants in a prophylactic dose, oral intake was started on the first postoperative day after gastrografin study. Patients were discharged on the second postoperative day after drain removal. Drugs prescribed for the patients were antibiotics, analgesics, proton pump inhibitors, and

anticoagulants for one week and multivitamin supplements for one year. Follow up was scheduled one week after surgery than after 3, 6, 9, and 12 months. During each visit, the operation was evaluated as regard BMI changes, postoperative complications, and any nutritional complications such as decrease plasma levels of albumin, hemoglobin, and calcium.

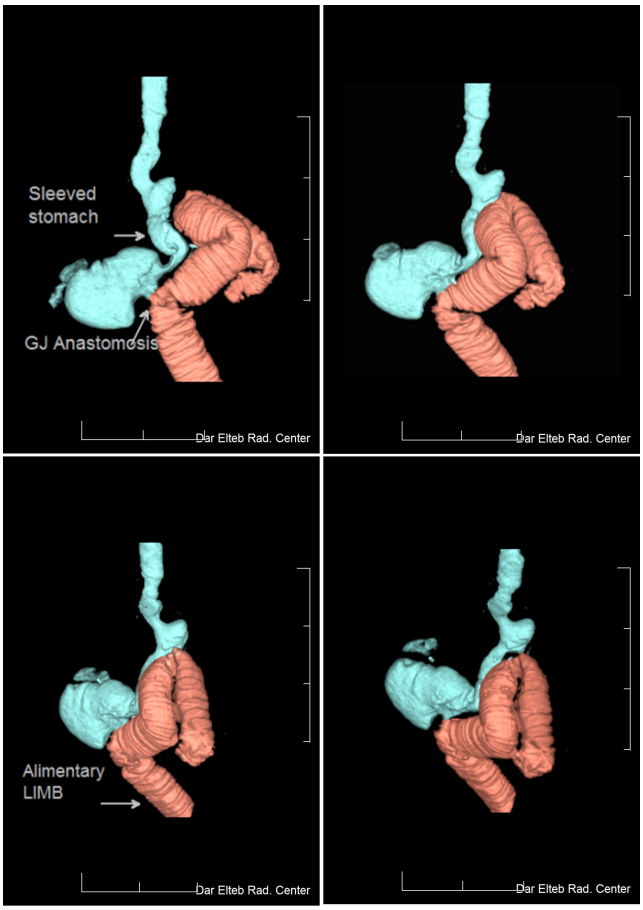

Figure 3: Normal CT volumetry shows after SASI.

RESULTS

Forty patients (25 females and 15 males) complaining from weight regain or unsatisfactory weight loss after IGB with a mean age of 28.2 years (ranged from 18 to 48 years) and an average BMI of 45.7 kg/m^2 (ranged from 40 kg/m^2 to 50 kg/m^2) were enrolled in this study (Table 1).

Table 1: Shows the demographic and preoperative data of patients.

Gender N (%)	**Male**	15	62.5%
	Female	25	37.5%
Age	**Range**	18	48
	Mean ± SD	28.2	2.6
BMI kg/m^2 before redo surgery	**Range**	40	50
	Mean ± SD	45.7	3.12
Cause of failure	**Regain weight**	28	70%
	Unsatisfactory weigh loss	12	30%

70% of the patients (28 cases) had weight regain after removal of the balloon, while 30% (12 cases) had unsatisfactory weight loss with the balloon.

LSG was successfully performed in 20 cases. The mean duration of intervention was 40.2 min (ranging from 25 min to 65 min) and the mean length of hospital stay was 1.2 days (ranging from 1 to 18 days). The mean BMI decreased to 31.41kg/m^2 (ranging from 28.8 kg/m^2 to 37.5 kg/m^2) after 1 year of the operation. One patient had leakage 10 days after the operation; it healed forty days after mega stent insertion. Another patient had intractable reflex not responding to medical treatment, was converted to RYGB 6 months after the operation. The nutritional complication wasn't detected in this group (Table 2).

Table 2: Shows the operative and postoperative data of patients.

	SASI	LSG	p-value
No of cases	20	50%	20
Duration of intervention	**Range**	45	-
	Mean ± SD	52.3	±
length of hospital stay	**Range**	1	-
	Mean ± SD	1.5	±
BMI kg/m^2 after the operation	**Range**	24.3	-
	Mean ± SD	26.3	±

SASI was performed in 20 cases. The mean duration of operation was 52.3 min (ranging from 45 min to 85 min). The mean length of hospital stay was 1.5 days (ranging from 1-8 days). The mean BMI decreased to 26.3 kg/m^2 (ranging from 24.3 to 33.1kg/m^2) one year after the operation. One patient had biliary reflux 6 months after the operation, he showed a good response for medical treatment, no postoperative leakage or bleeding occurs after the operation. None of our patients complained from GIT manifestations such as nausea, vomiting, abdominal cramps, discomfort, dumping, steatorrhea, or flatulence after eating. There were no changes in plasma levels of albumin, hemoglobin, calcium-plasma level during the first year after the operation. Finally, no mortalities occurred in this study.

DISCUSSION

Nowadays, bariatric surgery plays an essential role in the management of obesity and its associated comorbidities especially in the super obese patient, however, with the increase of incidence of obesity worldwide, less invasive or nonsurgical

maneuvers with fewer complications are needed for obesity management [8].

With the advances in minimally invasive surgeries, and Intragastric balloon appears as one of non-surgical options for the treatment of obesity and its complications. IGB is indicated mainly in patients with BMI less than 40kg/m^2 or as preoperative treatment in super-obese patients who are at risk as cardiac patients [9].

IGB behaves as space-occupying mass which increases satiety and decreases food consumption thus decreasing BMI. Long term studies showed that IGB has some drawbacks including a high incidence of weight regain after balloon removal or unsatisfactory weight loss especially in super-obese patients [10].

In comparison to IGB, LSG considered more efficient in the treatment of super obese patients as it can achieve rapid and greater weight loss in a short time, however, it carries more risk of complications and more hospital stay [11].

Single anastomosis sleeve ileal bypass is a malabsorptive procedure with good metabolic effect and minimal postoperative complications as it doesn't affect GIT function. SASI is characterized by its simplicity and efficacy and its low incidence of complications [4,12].

In this study, the mean operative time and mean postoperative hospital stay in the cases converted to sleeve gastrectomy were 40.2 min and 1.2 days respectively. On the other hand, cases converted into SASI the mean operative time and mean postoperative hospital stay was 52.3 min and 1.5 days respectively. We can detect that there is no significant difference between the two operations which reflect the simplicity of SASI.

One year after the operation, there was a significant difference between both procedures in weight loss in which the postoperative mean BMI of cases converted into SASI (26.3 kg/m^2) and that of cases converted into sleeve gastrectomy (31.4 kg/m^2), this difference can be explained by the malabsorptive effect of SASI.

In our study, there was a low incidence of complications after SASI in comparison to LSG. After SASI no leakage occurred and only one case suffered from reflux, this can be explained by low intragastric pressure and good blood supply around the gastroectomy anastomosis. On the other hand, there was one case of leakage and one case of reflux occurred after LSG this could be attributed to high gastric sleeve pressure. In a study done by Gagner et al, they stated that the incidence of upper leakage after LSG was 1.5% and a lower leak in 0.5% of patients [13]. In another study done by Serra et al, reported six gastric leaks after LSG which completely healed in five patients treated with a self-expandable covered stent, and one patient required a total gastrectomy after 3 months [14].

Postoperative nutritional status for the patients was normal in both groups due to the preservation of the normal pathway of the food in both surgeries.

From our experience, IGB increases the thickness and size of the stomach which increase and it makes marked adhesion between the posterior wall of the stomach and pancreas which increase the incidence of intra and postoperative complications. IGB is a restrictive procedure similar to LSG, on the other hand, SASI is a malabsorptive procedure that makes it more efficient and safer after fail IGB than LSG.

CONCLUSION

In this study, we can say that SASI is a safe and effective bariatric surgery after failed IGB in comparison to LSG. Till now there is no enough reported data in the literature about outcomes of bariatric surgery after failed IGB, the feasibility, safety, nor outcome of performing LSG immediately following removal of Intragastric Balloon (IGB). More studies and more number of patients who are going to perform bariatric surgeries after failed IGB need to determine the best bariatric operation after failed IGB.

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