

Conversion of sleeve Gastrectomy to Roux-en-Y Gastric bypass for weight loss failure

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Abstract:

Background: Obesity is a global health issue. Laparoscopic sleeve gastrectomy has progressively become the most popular procedure among the surgical community as a definitive bariatric operation. The increasing number of surgeries performed will be likely be followed by increasing reports of patients experiencing weight loss failure.

Objectives: To determine the effectiveness of conversion from laparoscopic sleeve gastrectomy to Roux-en-Y gastric bypass in cases with weight loss failure.

Patient & methods: retrospective review of patients who had operated with laparoscopic sleeve gastrectomy from October 2009 to January 2016 at saint Raphael hospital, 21 patients included in this study had insufficient weight loss after Sleeve Gastrectomy and converted to Roux-en-Y gastric bypass.

Results: fifteen patients (71.4%) had LSG as their single bariatric operation before conversion to roux en Y gastric bypass, 2 patients (9.5%) had Intra gastric balloon and 4 (19.1%) patients had laparoscopic adjustable gastric band before to their sleeve gastrectomy. Fourteen patients (66.6%) were female and 7 (33.4%) were males, At 6, 12, 18 months after bypass ,mean BMI was 37.2 (32.7-44.3),32.5(28.7-39.1) and 30.2 kg/m² (24.3-37.9 kg/m²) respectively , reflecting a %EWL (percentage weight loss) at 18 month of 61.7%.

Conclusion: insufficient weight loss after Sleeve Gastrectomy can be safely and effectively treated by conversion to Roux-en-Y gastric bypass to control weight loss failure or weight regain.

Keywords: weight loss failure, weight regain, failed Sleeve Gastrectomy.

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Introduction:

Obesity is a major health problem around the world. Bariatric surgery is the only effective treatment for morbid obesity and it is now being performed as one of the most common elective gastrointestinal procedures.(1) laparoscopic Sleeve Gastrectomy (LSG) was originally described as the restrictive part of biliopancreatic diversion with duodenal switch(2). During recent years, LSG has progressively gained popularity among the surgical community as a main bariatric operation. It was reported to be the most commonly performed bariatric operation in the world. It represented 37% of all procedures worldwide in 2013 (3).

The increasing number of surgeries performed will be likely be followed by increasing reports of patients experiencing weight loss failure, defined as insufficient weight loss or weight regain. Failure may be related to technical mistakes, such as the fashioning of too large gastric tube or incomplete resection of the gastric fundus, thus leaving a pouch that is prone to

dilation over time (4). As with any other bariatric procedure, failure may also occur in the absence of anatomic causes in patient with persistent nutritional or behavioral disorders that were underestimated at preoperative workup. These patients are not suitable candidates for revisional surgery and should be managed with diet and psychiatric counseling. Weight loss failure can also occur in the absence of a technical or behavioral/eating problem and likely represents underlying metabolic disease and altered set point that is resistant to a restrictive-only procedure.(5)

There are multiple approaches for secondary surgery after failed laparoscopic Sleeve Gastrectomy due to weight loss failure, but there are no guidelines regarding the procedure of choice in such patients , these procedures including duodenal switch, laparoscopic roux en Y gastric bypass(LRYGB), laparoscopic re-sleeve gastrectomy, and mini-gastric bypass(6,7).

Only few studies were conducted regarding conversion of failed laparoscopic Sleeve Gastrectomy due to weight loss failure to laparoscopic Roux-en-Y gastric bypass,

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Patients and Methods:

This study is a retrospective review of patients who had operated with LSG from October 2009 till January 2016, at saint Raphael hospital center of morbid obesity in this period, 742 patients underwent LSG as the primary procedure (starting the sleeve 6-7 cm from the pylorus with a calibration tube size of 36Fr), 21 patients included in this study had insufficient weight loss or weight regain and converted to roux en y gastric bypass, "sleeve failure defined as body mass index BMI>35 or percentage weight loss EWL<50%", all primary and revisional surgeries done by the same surgeon. A detailed dietary history was taken from all patients and any patient that with poor dietary habits and flaws was treated with frequent follow up supporting by education and motivation to improve their dietary habits. All patients investigated with OGD and an upper gastrograftin contrast study before the procedure. Exclusion criteria patients who had converted to Roux-en Y gastric bypass due to Sleeve Gastrectomy complications (leak and severe GERD) and patients with less than 18 months of follow up. All patients signed an informed consent, patient demographics, body mass index before and after the operation, time from the original surgery to the revisional procedure, postoperative complications, length of hospital stay, mortality rate and weight loss (i.e percentage of weight loss[%EWL]) prior to the second intervention and at follow up visits were documented. %EWL was calculated according to an ideal BMI of 25 kg/m².

Patients were followed up on an outpatient basis at 7 days, one month, 3 months, 6 months, 12 months and 18 months' time interval.

Surgical procedure: all procedures were done under general anesthesia with reverse Trendelenburg position. A prophylactic dose of third generation IV cephalosporin (RocephinTM 1g) and prophylactic dose of low molecular heparin (InnohepTM) 3500IU was given at the time of induction. Four ports insertion at the same previous scars of original surgery and an additional fifth port was inserted as needed, with CO₂ insufflation at pressure of 12mmHg. If there were any adhesions they released and the remanent stomach was identified and freed using a Harmonic scalpel. After mobilization of the proximal part of the stomach, the left crus was identified then a 20 ml gastric pouch was created using Endo GIA medium thick purple tristaple (CovidienTM), with resection any remaining or neofundus as needed, then a classical Roux en Y gastric bypass was performed with a 40cm pancreatobiliary limb and a 150cm alimentary Roux limb with antecolic antegastric fashion, all the mesenteric defects was closed using V-locTM suture and air leak was tested at the site of gastrojejunostomy, then a corrugated drain was fixed near gastrojejunostomy.

Postoperative care: all patient kept nil per oral at the first post operative day and kept on prophylactic anticoagulant, oral intake started on second day post op, 3rd post operative day the corrugated drain was removed in all patient and discharged home. Discharge medications include prophylactic anticoagulant (InnohepTM 3500IU) for seven days and oral proton pump inhibitors (Nexium[®] 40mg) for one month. The first follow up visit was scheduled at 7 post operative day.

Results:

A total 742 morbidly obese patients who operated with laparoscopic Sleeve Gastrectomy between October 2009 until January 2016, twenty-one patients (2.8%) underwent revision of a failed laparoscopic Sleeve Gastrectomy due to weight loss failure to laparoscopic Roux en Y gastric bypass. "Patients were considered LSG failure either because they had a BMI >35 or lost less than 50% of their excess weight". 15 cases (71.4%) underwent LSG as first bariatric procedure before conversion to Roux en Y gastric bypass, 2 cases (9.5%) had Intra gastric balloon prior to sleeve gastrectomy and 4(19.1%) cases had laparoscopic adjustable gastric band before sleeve gastrectomy. Fourteen patients (66.6%) were female and 7 (33.4%) were male, with a mean age of 38 years (range 24-52 years) and a mean BMI of 40.6kg/m² (range from 34.1-48.1 kg/m²). The mean time interval from sleeve gastrectomy to conversion to roux en Y gastric bypass was 36 months (range 14- 86 months).

All operations done through laparoscopic route conversion to open didn't occur; mean operative time was 90 minutes (range from 75- 135 minutes). Median hospital stay was 3.5 (3-4) days. Early post operative complications occurred in three (14.2%) patients, two of them had a early post operative bleeding that required re-laparoscopy with identification of bleeding points from the staple line and managed by clipping the source of bleeding, the other one had a massive heamatemsis, re-laparoscopy done with opening the site of gastrojejunostomy and identification of active arterial bleeding from the gastric pouch managed by clipping. Late complications were found in two patients (9.5%), one with hernia at the site of corrugated drain and one with severe iron deficiency anemia, there was no mortality. Patient demographics and preoperative and operative data were summarized in table 1

Table 1 demographic and perioperative and operative data

gender n=21	male	7 (33.4%)
	female	14 (66.6%)
mean age (range)	38 years (24-52)	
mean interval from sleeve (range)	36 months (14-86)	
previous bariatric surgeries	lsg	15(71.4%)
	gastric	2 (9.5%)
	ballon+lsg	4 (19.1%)
	gastric banding +lsg	
complications	early (<30 days)	3 (14.2%)
	late (>30 days)	2 (9.5%)

At 6, 12, 18 months after bypass, mean BMI was 37.2 (32.7-44.3), 32.5(28.7-39.1) and 30.2 kg/m² (24.3-37.9 kg/m²) respectively, reflecting a %EWL at 18 months of 61.7% compared to the pre-conversion BMI. Two patients (9.5%) with a BMI>35 and one patient (4.7%) with EBW>50% (excess body weight) were considered as failure.

Discussion

Sleeve Gastrectomy is the commonest bariatric surgery performed around the world (3,8). The outcome of this procedure is excellent in short and medium term with very low complications rate, it's technically not that difficult and not involving an enteric anastomosis, with short operative time in high risk patients, so its become the operation of choice for many bariatric surgeons(8), there is a wide range of failure rate in sleeve gastrectomy for long term follow up regarding weight loss, in this study the failure rate is 2.8%, but recent studies showed a higher failure rate than expected, Felsenreich et al(7) reports a failure rate of sleeve gastrectomy due to weight loss failure, GERD and leak of 37% with a 23% failure rate due to weight loss failure alone after 10 years of follow up, in 2015 Golomb et al(9) reported a % EWL 5 years post sleeve gastrectomy of 56.1% and he found a very high failure rate of 38.5%, in other hand, Abd Ellatif et al (10) used a Bougie size of 36Fr and start the sleeve from a short distance from the pylorus found a low failure rate of 2.6% at 7 years follow up and this result is similar to our findings, so the use of Bougie size of 36Fr and stating the sleeve 6-7cm from the pylorus decreases the insufficient weight loss in long term follow up(10,11)

Weight loss failure following Sleeve Gastrectomy could be occurred not just due to technical errors. Sleeve gastrectomy is a restrictive operation, so patient factors play a major role, many patients didn't adhere

to strict diet and this is a significant factor, because fluid with high glycemic index can easily go through the sleeved stomach, and this issue is also found in any purely restrictive procedure such as gastric band, so if dietary flaw was detected, weight loss failure can be treated with patient motivation and education with frequent follow up (11).

Ghrelin is the hormone that produced from ghrelin producing cells in gastric fundus, its play a major role in inducing food intake and increase appetite, this hormone is significantly decreasing after Sleeve Gastrectomy and consider as a contributing factor in initiation weight loss in early period post Sleeve Gastrectomy(12), a study by Bohdjalian et al(12) found an increase in plasma ghrelin level 5 years after Sleeve Gastrectomy and this may contribute the weight regain after the procedure, a recent study by Disse et al(13) found that the sleeve dilatation was the main cause for weight loss failure or weight regain following Sleeve Gastrectomy, its believed that sleeve dilatation causing an increase food intake and decrease the restrictive capacity of the procedure and all these factors contributed to weight loss failure.

Many surgical options have been suggested for Sleeve Gastrectomy failure due to insufficient weight loss; Dapri et al (14) and Alsabab et al (15) tried a re-Sleeve for patient with weight loss failure both showed a low %EWL (44 vs 57%) respectively. So, we believed that a restrictive procedure that failed once will probably failed again so we do not adopt re- sleeve procedure in our practice. Carmeli et al(16) and Holman et al (17) compared their long term outcomes when switching a sleeve due to insufficient weight loss to a (RYGB), or a (BPD-DS), BPD-DS, patients achieved greater %EWL in both studies (80 vs. 65.5%) and (74 vs. 57%) respectively yet the BPD-DS group had a significantly higher complications rate and longer hospital stay. Despite the excellent result of BPD-DS in maintaining weight we consider this procedure is too aggressive with significantly high morbidity and mortality rates, leaving laparoscopic Roux en Y gastric bypass is the procedure of choice in cases with inadequate weight loss following Sleeve Gastrectomy. In this study the %EWL is 61.7 at 18 months follow up, comparing this result with a study done by Iannelli et al(18) who converting 40 patients with failed sleeve to roux en y gastric bypass with %EWL of 64% at 18 months post conversion, another study by Quezada et al(19) which converted a 28 sleeve into gastric bypass who operated them for weight loss failure and they showed a %EWL of 67% at 36 months follow up. Gautier et al (20) converted 18 patients from sleeve to bypass, 9 of them for weight loss failure, the %EBMIL was significantly improved to 65% post roux en y gastric bypass.

Conclusion:

Insufficient weight loss after Sleeve Gastrectomy can be safely and effectively treated by conversion to Roux-en-Y gastric bypass to control weight loss failure or weight regain, long term follow up and long term patient control are needed in order to maintain these good results, although larger study is needed to draw a definitive conclusions.

Authors' contribution:

Dr. Ramiz Sami Mukhtar: operated all patients (main surgeon), patients follow up, literature review
Dr. Mohammed Qasim Abdul Jabbar: assistant, data collection, study design, manuscripts writing
Dr. Mustafa Adil Abbas: data collection

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