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Original Article

Outcomes of Sleeve Gastrectomy Among Iranian Obese Patients

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Abstract

Background: Obesity is the most common human metabolic disorder that causes many complications for patients worldwide. On the other hand, Sleeve Gastrectomy is one of the bariatric surgeries that are used by surgeons in morbid obese patients to treat obesity. The aim of this study was to survey on results of Sleeve gastrectomy and its subsequent complications among Iranian patients.

Methods: This is a case series study in which data of 92 morbid obese patients were gathered. Patients were followed up at intervals of 1.5, 3, 6, 12, and 18 months after operation. History of post-operative complications, appetite and satisfaction were taken from patients, physical examination was performed as well as measuring weight and BMI in follow-up visits. Ultrasonography was performed in 6, 12 and 18 months after the surgery for assessing gallbladder.

Results: Mean BMI (body mass index) was 45.43 (± 8.41) kg/m2 in patients. Mean BMI reduction was respectively 4.5 (±1.12), 9.03 (±2.44), 13.45 (±3.45), 17.57 (±4.66), 19.82 (±5.78), 17.57 (±4.66) and 19.82 (±5.78) kg/m2 at 1.5, 3, 6, 12, and 18 months after operation, respectively. Mean weight loss was 71.5% 18 months after operation.

Conclusions: Current study reveals that Sleeve Gastrectomy is an effective method of bariatric surgery in which patients encounter a small number of side effects, and, also, is highly recommended for morbid obese patients.

Key words: Morbid obesity, Sleeve Gastrectomy, BMI, weight loss

Introduction

Obesity is the most common metabolic disorder, and, moreover, the oldest one. Obesity reduces quality of life, and also causes many complications shortening life expectancy. These complications including cardiovascular diseases such as coronary heart disease, hypertension, heart failure, diabetes, impaired lung function (i.e. sleep apnea, Hypoventilation), Hypercoagulable states, degenerative arthritis, gallstones, gastroesophageal reflux, and depression may lead to high morbidity and mortality rates--12 times more than normal population [1, 2].

Although non-medial approaches, life style modifications such as hypocaloric diet and/or increased physical activity, are the mainstay of the obesity treatment, they did not have much success in treating obesity. This failure is mostly due to the difficulty of long term usage of them for patients, regaining weight within 18 months after weight loss, and losing weight through exercise is not usually more than 10 percent. Previous studies demonstrated that exercise and diet cannot provide a long-term weight loss in patients with over 35 kg/m2 BMI [3-6].

To treat morbid obesity, various surgical procedures have been developed. The three categories are restrictive surgery, malabsorptive surgery or a combination of these operations [2]. A restrictive surgery method is Sleeve Gastrectomy introduced as standard surgery to treat obesity by Metabolic Surgical Society of America [7]. This method is indicated in patients with 35 to 50 kg/m2 BMI and those whose main problem is frequent feeling of hunger. In patients whose BMI is over 60 kg/m2, first duodenal switch operation is performed until their BMI reaches to 50 kg/m2, and then the subsequent surgery will be performed. For patients with co-morbidities such as anemia, Crohn's disease, severe asthma or NSAID use, Sleeve Gastrectomy is better than gastric bypass surgery because they are prone to marginal ulcer. Those patients who do not want to have foreign bodies such as rings Sleeve Gastrectomy is the method of choice .[7-9]

In here, we conduct a prospective study on the outcomes of Sleeve gastrectomy and its complications among Iranian obese patients.

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Methods

This prospective study was carried out from October 2014 to September 2016 in 2 private surgery clinics. Inclusion criteria were all patients who were proper candidate for sleeve gastrectomy, having BMI over 35 kg/m2. Exclusion criteria were patients aged less than 16 years, over 60 years old, previous bariatric or stomach surgery, positive history of blood products transfusion due to hematologic diseases--such as hemochromatosis, Wilson's diseases, and chronic inflammation—neurologic, or psychiatric diseases. Gathered variables are BMI loss after surgery, weight loss after surgery, self-satisfaction of patient, presence of gallstone, changes in appetite (preoperative Vs. post operative), diabetes, hypertension, obstructive apnea, arthralgia and hyperlipidemia.

In the first visit, patient's co-morbidities such as diabetes, obstructive apnea, hypertension, arthralgia and hyperlipidemia were recorded. In that very visit, patient's attitude towards obesity, it's treatment, and psychiatric effects were discussed with the patient and his/her family. Surgical techniques, including advantages and complications of each one, were described as well as preoperative and postoperative cares and postoperative follow-up. Only patients who underwent sleeve gastrectomy were selected for this study. Written consent form was obtained from all patients.

Patients were hospitalized from one day before surgery for preoperative preparations. Deep vein thrombosis prophylaxis (DVT), with heparin or Celexan, Ranitidine, and antibiotic prophylaxis were prescribed for patients postoperatively. Patients were NPO for the first 2 days following surgery; then, their diet changed to clear liquids. On the 4th day post operatively after oral tolerance, patients were discharged from clinic. All patients were well educated about possible side effects before discharge. six patients were excluded from this study, 2 of whom because they refused operation and four of whom because they did not come to follow-up visits).

Patients were followed up at intervals of 1.5, 3, 6, 12, and 18 months after the surgery. Ultrasonography was performed for all patients in 6, 12, and 18 months after the surgery to exclude gallbladder stones.BMI (kg/m2) was calculated from patients' weight and height.

Self-Satisfaction was measured with Likert Scale survey. Diabetes diagnosis was based on American Diabetes Association (ADA) guideline. Hyperlipidemia diagnosis was based on American Association of Clinical Endocrinologists (AACE). Hypertension, obstructive apnea and arthralgia diagnosis was based on history and clinical examinations. Statistical Method :Analysis was accomplished using the Statistical Package for Social Sciences (SPSS 16, SPSS Inc., Chicago, US). A P value less than 0.05 is considered statistically significant. Variables are expressed as number (%) or mean± standard deviation (SD). Qualitative data were compared by chi-square test and quantitative data were compared by Pearson correlation ratio.

Results

Of all 92 patients, 58 (63.5%) patients were female and 34 (36.5%) were male. The mean age of patients was 37.45 (± 7.23) years (16-57 years old). The mean BMI was 45.43 (± 8.41) kg/m2. Mean operation time was 98.12 (± 13.54) minutes. Three (3.26%) patients had leakage, but surgery related complications such as peritonitis, pulmonary emboli, and bleeding did not observe among patients. Operation leakage was within the first week following the surgery in 2 (66.6%) cases, in both of whom was discharge from wound (fistula), and in one of the patients (33.3%) with leakage, it was associated with sub-diaphragmatic abscess after four months of the surgery. All these 3 (100%) patients were reoperated.

Appetite reduction rate at 1.5 months after operation was high in 1 (1.08%) patient and it was high in 10 (10.38%) patients at 18 months after operation. Table 1 outlines appetite changes.

Before operation, 7 (7.6%), 52(56.5%), 32 (34.7%), 83 (90.2%), and 52 (56.5%) patients had diabetes, hypertension, obstructive apnea, arthralgia, and hyperlipidemia, respectively (Table 2). After 18 months postoperatively,1 (1.08%), 27(29.34%), 14(15.21%), 13(14.13%), and 30(32.6%) patients had diabetes, hypertension, obstructive apnea, arthralgia, and had hyperlipidemia.

Three (3.26%) patients developed gallstone after surgery, one (33.3%) of whom developed within the first six months following surgery while 2 (66.6%) of whom developed after six months.

Mean BMI reduction after a 1.5, 3, 6, 12, and 18-month follow-up period was 4.5 (± 1.12), 9.0 (± 2.44), 13.4 (± 3.45), 17.5 (± 4.66), 19.82 (± 5.78) kg/m2, respectively. BMI was less than 50 kg/m2 in 77(83.69%) patients whereas was over 50 kg/m2 in 15 (16.3%) patients. In the patients whose BMI was less than 50 kg/m2, mean BMI reduction after 1.5, 3, 6, 12, and 18 months was 4.03 (±1.03), 8.19 (±2.38), 12.2 (±3.55), 15.95 (±4.56) and 18.06 (±5.82) kg/m2, respectively, but in those whose BMI was over 50 kg/m2, mean BMI reduction after 1.5, 3, 6, 12 and 18 months was 4.98 (±1.81), 9.9 (±2.84), 14.75 (±4.23), 19.31 (±5.47) and 21.72 (±7.05) kg/m2, respectively. Mean BMI reduction within men after 1.5, 3, 6, 12 and 18 months was 4.56 (±1.12), 9.13 (±2.45), 13.46 (±3.66), 17.84 (±4.68) and 20.16 (±6.11) kg/m2, respectively, but mean BMI reduction within women after 1.5, 3, 6, 12 and 18 months was 4.41 (±1.11), 8.88 (± 2.41), 13.27 (±3.62), 17.23 (±4.58) and 19.65 (±6.01) kg/m2, respectively.

Maximum and minimum weight loss after an 18-month follow-up was 86.4% and 60.1% (Figure 1).

Eighty-five (92.3%) and 82 (89.1%) were completely satisfied of the outcome of their surgery after 1.5 and 18 months postoperatively while 2 (2.1%) expressed dissatisfaction about the outcome of their surgery after 1.5 and 18 months following surgery (Table 3).

Table 1: appetite reduction rate in patients

Time After Surgery	Appetite				
	Very low	Low	No change	High	Very high
1.5 months N	63	25	2	1	1
(%)	(68.4)	(27.1)	(2.1)	(1.0)	(1.0)
3 months N	59	30	2	1	1
(%)	(63.4)	(32.6)	(2.1)	(1.0)	(1.0)
6 months N	45	26	10	6	5
(%)	(48.9)	(28.2)	(10.8)	(6.5)	(5.4)
12 months N	43	27	10	7	5
(%)	(46.7)	(29.3)	(10.8)	(7.6)	(5.4)
18 months N	38	26	12	10	6
(%)	(41.3)	(28.2)	(13.0)	(10.8)	(6.5)

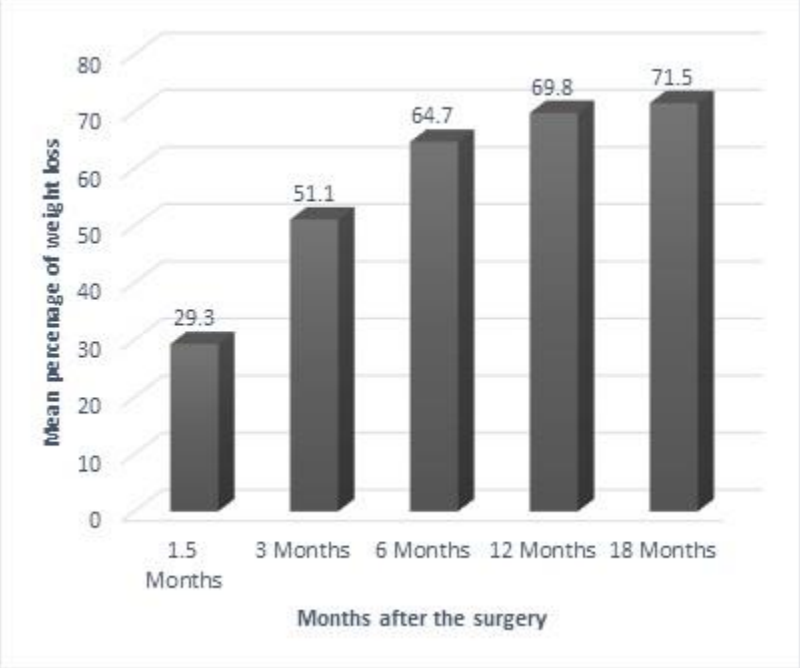
Table 2: changes in co-morbidities

Time / Comorbidity	Before Surgery	1.5 Months	3 Months	6 Months	12 Months	18 Months	p-value
Diabetes N	7	5	3	2	2	1	0.02
(%)	(7.6)	(5.4)	(3.2)	(2.1)	(2.1)	(1.0)	
Hypertension N	52	47	43	32	30	27	0.01
(%)	(56.5)	(51.0)	(46.7)	(34.2)	(32.6)	(29.3)	
Obstructive apnea N	32	28	25	21	19	14	0.01
(%)	(34.7)	(30.4)	(27.1)	(22.8)	(20.6)	(15.2)	
Arthralgia N	83	75	61	49	36	13	0.035
(%)	(90.2)	(81.5)	(66.3)	(53.2)	(39.1)	(14.1)	
Hyperlipidemia N	52	38	37	35	22	30	0.033
(%)	(56.5)	(41.3)	(40.2)	(38.0)	(23.7)	(32.6)	

Table 3. Outlines rate of satisfaction and dissatisfaction within patients postoperatively.

Time (Month)	Satisfaction		Dissatisfaction
	Complete N (%)	Somewhat N (%)	N (%)
1.5	85(92.3)	5(5.4)	2(2.17)
3	84(91.3)	6(6.5)	2(2.17)
6	85(92.3)	4(4.3)	3(3.26)
12	83(90.2)	6(6.5)	3(3.26)
18	82(89.1)	8(8.6)	2(2.17)

Figure 1. weight loss after the surgery.



Discussion

Unfortunately, today, the prevalence of overweight and obesity is increasing in both developed and developing countries worldwide. Some studies have indicated that the prevalence of obesity has been doubled. According to World Health Organization statistics in 2016, 1.9 billion adults were overweight, over 650 million of whom were obese throughout the world. Prevalence of overweight and obesity among Iranian adults were reported 23 and 40%, respectively [3, 4].
This study reveals that Sleeve Gastrectomy dramatically declines BMI, which is consistent with previous studies. Mean weight loss at 8 months after Sleeve surgery was 35.7 (± 10.1) kg in Kiriakopoulos et al study, in 2009, which is similar to this study. In same year, in a study of Tagaya et al, patients were categorized into 2 groups based on BMI. Patients whose BMI was less than 50 kg/m2, average BMI reduction after 18 months postoperatively was 6.4 (kg/m2) whereas those whose BMI was over 50 kg/m2, average BMI reduction at same period was 11.9 (kg/m2). Fuks et al reported 38.6% and 49.4% for weight loss after 6 and 12 months, respectively, but weight loss in their study is less than that of current study. In 2012, TO VT et al study BMI reduction was 11, 12, and 13 (kg/m²) at 6, 12, and 24 months postoperatively, respectively, similar to the outcome of this study [10-12].
Sleeve Gastrectomy has only a few long term and short term complications. In here, about 3% of patients developed gallstone and some 3% had leakage after operation. In Tagaya et al study, only one patient developed some complication, so they concluded that this method is an appropriate surgery method in patients whose BMI is less than 50 (kg/m2). In Fuks et al study 7 patients developed fistula after the procedure [10, 11].
Appetite reduction was considerable in this study and in favor of literature. Kiriakopoulos et al demonstrated that sleeve gastrectomy significantly reduces appetite.
Satisfaction among participants of this study was appropriate, and it can be drawn that probably is due to favorable weight loss, reduction of appetite [10, 13]. The number of co-morbidities was declined postoperatively in this study which is similar to studies recently published. TO VT et al showed that Sleeve surgery reduces Glucose, HbA1c, Triglycerides, HDL-cholesterol, hypertension and fasting blood glucose. The study of Zanchariah et al, in 2013, indicated that remission of diabetes, hypertension, and hyperlipidemia was 66.67, 100, and 50 %, respectively, after 5 years following sleeve gastrectomy [12, 14].This study reveals that sleeve gastrectomy does not accompany considerable sequences, and, also, is an effective procedure to reduce weight, so Sleeve Gastrectomy is an effective way of treatment for morbid obesity.

Conclusion

Sleeve gastrectomy is a safe procedure to reduce weight with minimal complications, and may be recommended for morbid obese patients.

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