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Comparing Outcomes of two Methods of Bariatric Surgery (LSG and LAGB) in Southern Iran

Seyed Hossein Hosseini [1], Ahmad Izadpanah [1,*], Seyed Vahid Hosseini [1], Hossein Shabahang [2], Elaheh Ashrafi [3], Ali Reza Safarpour [1], Abbas Rezaianzadeh [4], Zahra Zabangirfard [1]

[1]Colorectal Research Center, Shiraz University of Medical Sciences, Shiraz, IR Iran
[2]Mashhad University of Medical Sciences, Mashhad, IR Iran
[3]Shiraz University of Medical Sciences, Shiraz, IR Iran
[4]Research Center for Health Sciences, Shiraz University of Medical Sciences, Shiraz, IR Iran

*Corresponding author: Ahmad Izadpanah, Colorectal Research Center, Shiraz University of Medical Sciences, Shiraz, IR Iran. Tel/ Fax: +98-7112306972, E-mail: E-mail: colorectal92@yahoo.com.

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Background: Since morbid obesity is known as a major cause of psychosocial problems beside its common adverse effects like cardiovascular and metabolic diseases, a lot of researches have been performed to find an effective treatment including surgery. Surgical methods were improved by invention of minimal invasive surgeries. Laparascopic Sleeve Gastrectomy (LSG) and Laparascopic Adjustable Gastric Banding (LAGB) are the methods which have become common in most of developed countries.
Objectives: Due to cultural, economic and social differences between our country and developed countries, we have designed this research to compare the efficacy and complication of these two methods six months after operation in hospitals affiliated to Shiraz University of Medical Sciences.
Patients and Methods: Documents of patients operated with one of these two methods were reviewed, and necessary information was inserted in prepared forms. We called patients if further information was needed. Then this data was analyzed with Chi Square 2Sample Independent T- test and Paired T Test by SPSS 16 software.
Results: Seventy patients were operated with LSG and 25 with LAGB. The Mean weight of LSG group was 120.73 and 120 for LAGB. The Mean weight loss in LSG was 29.99 and 19.60 in LAGB. There was no statistically significant difference regarding early complications between the two methods; although, long term complications such as gastric stenosis and band displacement were statistically more in LAGB.
Conclusions: It seems that both LSG and LAGB are efficient in weight loss but LSG can lead to more weight loss, better correction of blood pressure and less long term complications.

Keywords: Morbid Obesity; Bariatric Surgery; Developing Countries

1. Background

Morbid obesity (MO) is associated with a wide range of physical, mental and social comorbidities. Metabolic disorders, pulmonary diseases, cardiovascular problems and depression are typical examples (1, 2). Consequently, both patients and physicians have tried to find more effective solutions to deal with this problem. The first and possibly most important treatment revolves around changing one's life style including his or her diet and exercise (3). According to recent studies, less than 9% of patients are able to maintain their weight loss after one year. This might be the main reason which has driven physicians to consider surgical treatment to address M.O (1-7). Applying surgical treatment to handle M.O dates back to more than 50 years ago (2, 8). Throughout these years various surgical methods such as Gastric Restrictive Operation, Mixed and Mal-absorptive procedures have been tried. The advent of minimal invasive surgery has led to more innovative methods such as Laparoscopic Adjustable Gastric Banding (LAGB) and Laparoscopic Sleeve Gastrectomy (LSG) (9, 10). These techniques are widely embraced due to better outcomes and fewer complications (6, 8, 11). In developed countries many studies have been conducted to assess possible outcomes of these two methods (2, 5). In the Middle East, these techniques have been employed in a limited number of centers, while very little research has been performed to examine possible effects on patients (12).

2. Objectives

Considering cultural and genetic differences between the Middle East and more developed countries, we found

Implication for health policy/practice/research/medical education:
This manuscript would be practical in bariatric surgery.

it reasonable to conduct a study to compare early outcomes of these two methods.

3. Patients and Methods

Records of patients with morbid obesity underwent bariatric surgery (LAGB, LSG) in centers affiliated to Shiraz University of Medical Sciences from December 2009 to May 2012 were reviewed. Exclusion criteria were Roux en-y gastric bypasses and opens surgery. All other cases including 12 men and 83 women with the mean age of 36.34 years, the mean pre-op weight of 120.54 kg, and the mean BMI of 43.35 kg/m^2 were entered the study. They were divided into two groups: LSG group with 70 cases and LAGB group with 25 cases. All patients had received other treatments with no success. Patients were introduced to obesity clinic where they took part in a multidisciplinary decision making session including a psychologist, an endocrinologist, a dietitian, a nutritionist, a cardiologist, and an anesthesiologist. Finally, the operating surgeon explained the technique of surgery, related advantages, disadvantages and complications to patients completely and an informed consent was taken. Patient's mental status and any history of vascular disease, previous operations were recorded. Physical examination, laboratory tests including CBC, BS, TG, cholesterol and paraclinical measures including abdominal ultrasound and endoscopy were performed for all patients. Laparoscopic cholecystectomy and medication for peptic ulcer were also prescribed if applicable. Early post operation ambulation and chest physiotherapy were performed. Then subcutaneous injection of LMWH was started one day post-op. Gastrographin dye study to rule out any probable upper GI injuries was performed before surgical diet was started, two days post-op when the patient tolerated liquid diet, he or she was discharged with a one week follow-up. Postoperation parameters to be evaluated were the rate of weight loss, early and late complications such as leakage, perforation, bleeding and reoperation, BMI reduction, change in systolic and diastolic blood pressure, and vitamin D deficiency. These parameters were evaluated one week, one month, and six months postoperatively, and recorded in prepared forms. This data was analyzed with Chi-Square sample independent t-test and paired t-test by SPSS 16 software.

4. Results

Records of 95 patients with morbid obesity underwent LSG or LAGB in hospitals affiliated to Shiraz University of Medical Sciences between December 2009 and May 2012 were evaluated. Seventy patients were operated with LSG and 25 with LAGB. Preoperation data of both groups is shown in Table 1. It shows acceptable similarities between the two groups regarding age and weight. Early complications were leakage from operation site in one patient and bleeding in two for LSG group versus bleeding in one and lower extremity edema in one for LAGB group which means no statistically significant difference regarding early complications between LSG and LAGB. Reviewing patients' data of six months postoperation, there was no difference between the two groups. However, considering late complications specific for LAGB such as band displacement, band opening, gastric stenosis, and PTE, they were significantly more in LAGB group (P = 0.013) (Table 2). Weight loss, reduction in BMI, systolic and diastolic blood pressure six months postoperation in both groups are shown in Table 3. The data shows acceptable weight loss in both groups six months postoperatively, but it was more in LSG group (P = 0.001). Reduction in the mean BMI was more in LSG group (P < 0.05). Systolic blood pressure decreased more in LSG group (P = 0.024). While diastolic blood pressure had an acceptable reduction in both groups, there was not a statistically significant difference between the two groups.

Table 1. Preoperative Data of Both Groups

Data	Operation		Sum
	LSG	LAGB	
Age, y[a]	38.17 ± 10.31	31.20 ± 9.22	36.34 ± 10.45
Weight, kg	12.73 ± 28.45	120.00 ± 24.96	120.54 ± 27.44
Systolic blood pressure	126.07 ± 23.63	120.40 ± 6.75	124.58 ± 20.68
Diastolic blood pressure	79.50 ± 7.07	78.60 ± 3.39	79.26 ± 6.31
BMI	44.65 ± 7.73	42.72 ± 6.97	44.14 ± 7.55

[a] Data are shown with Mean ± SD

Table 2. Complications of Both Groups during Six Months for Post-operation

Complication	Group Operation	
	LSG	LAGB
Cholecystitis	1 (1.428)	0
Vit def	11 (15.71)	4 (16)
Band opening	0	2 (8)
Gastric stenosis	0	3 (12)
Band displacement	0	2 (8)
PTE	0	1 (4)

5. Discussion

Our study showed that significant weight loss was occurred in both, LSG and LAGB groups, but more for the LSG group. Additionally, there was a statistically significant reduction in systolic blood pressure in both groups, while reduced diastolic blood pressure was significant

Table 3. Comparison of Results

Groups	Mean weigh loss	Mean BMI Reduction	Mean decrease in systolic blood pressure	Mean decrease in diastolic blood pressure
LSG	29.99	11.00	12.42	4.92
LAGB	19.60	6.96	3.40	2.00

only for the LSG group. Our findings are in concordance with previous studies of developed countries. Evaluating the results of some studies on LSG, Dr. Iannelli et al. published an article in 2008, to emphasize this technique as the main and first choice for patients with morbid obesity. It is mentioned that patients with BMI ranging from 37.2 to 65.4 were treated using this technique (13). In another retrospective study in 2012 by Dr. Behrens et al. 34 patients treated by LSG were assessed. In the mean post operation follow up time of 10 months, the mean weight loss was 27.4 ± 9 kg (3.3 kg per month). The study adores on LSG as a safe and effective treatment for morbid obesity (14). Comparing these results with those of ours, it seems that weight loss is almost the same in both studies but complications are less in our region. However, sample size and other confounding factors should also be regarded. Of course there are several studies that support LAGB as a good option for handling MO. In a prospective study published in 2003 by Dr. Zinzindohoue et al. 500 patients with morbid obesity who underwent LAGB from 1997 to 2001 were evaluated. The Mean weight and BMI were 120.7 kg and 44.3 kg/m^2 respectively before surgery. No mortality was reported. Fifty two patients (10.4%) were reoperated due to postoperation complications (15). Moreover, results of one review study evaluating LAGB by Dr. Kral et al. revealed that patients have not been followed up for a sufficient time in most studies. However, mortality rate of LAGB was less than other techniques (0.2 percent). In addition, malabsorption of vitamins and minerals is less in this technique compared to other ones. Authors of the article concluded that blood pressure in patients treated with LAGB decreased first but increased after 3 years (16). Results of another review study published in 2011 by Dr. Franco et al., to compare LAGB with LSG and LRYGB showed that banding method is often safer but has more insignificant complications. It suggests that these three techniques have acceptable results regarding weight loss and complications. So, it is up to both surgeon and patient which method to choose (2). It seems that both LSG and LAGB are efficient in weight loss but LSG can lead to more weight loss, better correction of blood pressure, and less long term complications. So depending on patient's status and surgeon's experience it can be regarded as the first treatment. However, larger sample size and longer follow up period are needed for definite deduction in this regard.

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Authors' Contribution

Main idea was proposed by Dr. Seyed Hossein Hosseini, Dr. Ahmad Izadpanah, Dr. Seyed Vahid Hosseini, Dr. Ali Reza Safarpour, Dr. Abbas Rezaianzadeh, study design and data analysis was performed by Dr. Ahmad Izadpanah, Dr. Ali Reza Safarpour, Dr. Abbas Rezaianzadeh, data collection and writing of primary draft was performed by Dr. Hossein Shabahang, Dr. Seyed Hossein Hosseini, Dr. Elaheh Ashrafi, Zahra Zabangirfard. Revising the article and final approval were performed by all the authors.

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The authors declare no conflict of interest.

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References

1. Finucane MM, Stevens GA, Cowan MJ, Danaei G, Lin JK, Paciorek CJ, et al. National, regional, and global trends in body-mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9.1 million participants. *Lancet*. 2011;**377**(9765):557–67.
2. Franco JV, Ruiz PA, Palermo M, Gagner M. A review of studies comparing three laparoscopic procedures in bariatric surgery: sleeve gastrectomy, Roux-en-Y gastric bypass and adjustable gastric banding. *Obes Surg*. 2011;**21**(9):1458–68.
3. Shekelle PG, Newberry S, Maglione M, Li Z, Yermilov I, Hilton L, et al. Bariatric surgery in women of reproductive age: special concerns for pregnancy. *Evid Rep Technol Assess (Full Rep)*. 2008(169):1–51.
4. Heneghan HM, Meron-Eldar S, Brethauer SA, Schauer PR, Young JB. Effect of bariatric surgery on cardiovascular risk profile. *Am J Cardiol*. 2011;**108**(10):1499–507.
5. Magdaleno R, Jr, Pereira BG, Chaim EA, Turato ER. Pregnancy after bariatric surgery: a current view of maternal, obstetrical and perinatal challenges. *Arch Gynecol Obstet*. 2012;**285**(3):559–66.
6. Mahdy T, Atia S, Farid M, Adulatif A. Effect of Roux-en Y gastric bypass on bone metabolism in patients with morbid obesity: Mansoura experiences. *Obes Surg*. 2008;**18**(12):1526–31.
7. Vest AR, Heneghan HM, Agarwal S, Schauer PR, Young JB. Bariatric surgery and cardiovascular outcomes: a systematic review. *Heart*. 2012;**98**(24):1763–77.
8. Schneider BE, Mun EC. Surgical management of morbid obesity. *Diabetes Care*. 2005;**28**(2):475–80.
9. Brody F. Minimally invasive surgery for morbid obesity. *Cleve Clin*

J Med. 2004;**71**(4):289–296-8.
10. Pories WJ. Bariatric surgery: risks and rewards. *J Clin Endocrinol Metab*. 2008;**93**(11 Suppl 1):S89–96.
11. Nguyen N, Champion JK, Ponce J, Quebbemann B, Patterson E, Pham B, et al. A review of unmet needs in obesity management. *Obes Surg*. 2012;**22**(6):956–66.
12. Saruc M, Boler D, Karaarslan M, Baysal C, Rasa K, Cakmakci M, et al. Intragastric balloon treatment of obesity must be combined with bariatric surgery: a pilot study in Turkey. *Turk J Gastroenterol*. 2010;**21**(4):333–7.
13. Iannelli A, Dainese R, Piche T, Facchiano E, Gugenheim J. Laparoscopic sleeve gastrectomy for morbid obesity. *World J Gastroenterol*. 2008;**14**(6):821–7.
14. Behrens C, Tang BQ, Amson BJ. Early results of a Canadian laparoscopic sleeve gastrectomy experience. *Can J Surg*. 2011;**54**(2):138–43.
15. Zinzindohoue F, Chevallier JM, Douard R, Elian N, Ferraz JM, Blanche JP, et al. Laparoscopic gastric banding: a minimally invasive surgical treatment for morbid obesity: prospective study of 500 consecutive patients. *Ann Surg*. 2003;**237**(1):1–9.
16. Kral JG, Naslund E. Surgical treatment of obesity. *Nat Clin Pract Endocrinol Metab*. 2007;**3**(8):574–83.