Laparoscopic Sleeve Gastrectomy for Morbid Obesity: UAE Tertiary Care Hospital Initial Experience

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ABSTRACT

Aim: To study efficacy of Laparoscopic Sleeve Gastrectomy (LSG) for morbid obesity as a measure of weight reduction over a period of one year from May 2011 – 2012.

Materials and Methods: Morbidly obese patients (n=109) referred from clinics with primary problem of obesity and consequent co-morbidities underwent the procedure LSG during a period of one year. The data included; demographics, weight of patients/BMI. Comorbid conditions, preoperative work up, indications for surgery, length of hospital stay, duration of surgery, postoperative complication and reduction of weight at 3 weeks, 3, 6 and 12 months.

Results: Out of 109 patients, 94 (86%) are below 40 years of age, reflecting high prevalence of obesity in the younger population in UAE. As per gender, 67 (61.5%) are female and 42 (38.5%) male. Preoperatively, mean weight is 121±16 kg; 68 (62.4%) patients have BMI 40-50 kg/m^2 and 41 (37.6%) of 35-40 kg/m^2. 12 (11%) patients are diabetics (DM), 9 (8.3%) hypertensive (HTN). 12 (11%) have symptoms of Gastritis, 3 (2.8%) have shown Clo test +ve., 7 (6.4%) complaining Knee...
Joint pain, 3 (2.8%) with Backache, 2 (1.8%) patients are diagnosed cases of gastroesophageal reflux disease (GERD), though 58 (53.2%) have no comorbidities. Among those 107 (98.2%) patients are referred to dietitian. All patients underwent laparoscopic sleeve gastrectomy (LSG). Postoperatively, 104 (95.4%) patients were without any complication. 1 (0.9%) patient has bleeding while 4 (3.7%) has minor issues (nausea, vomiting) and there was no leak in this group of patients. On follow up, there was a significant weight loss and improvement of comorbidities: At 3 weeks post op, the mean weight was 113±16 kg, at 3 months 103±13 kg, at 6 months 92±12 kg and at 1 year 82±10 kg. Complete resolution of Diabetes Mellitus (DM) observed in 7 (58.33%) out of 12 patients and improvement in 5 (41.55%). Complete resolution of hypertension (HTN) in 5 (55.55) and improvement in 4 (44.44). Gastritis completely resolved in 10 (83.33) and improved in 2 (16.66). The patients who had knee joint pain and backache, all improved.

Conclusion: LSG has clearly proven its efficacy for morbid obesity in term of weight reduction and consequent co-morbidities. It's gaining popular in community being an acceptable and safe procedure.

Keywords: Laparoscopic Sleeve Gastrectomy (LSG); morbid obesity; bariatric surgery.

1. INTRODUCTION

Obesity is defined as body-mass index of more than 30 kg/m\(^2\). It's divided into class I, II, and III (class I = 30–34.9 kg/m\(^2\), class II = 35–39.9 kg/m\(^2\), and class III > 40 kg/m\(^2\)). Its prevalence has markedly increased during few decades, and is responsible for more health care expenditures than any other medical condition. While obesity has increased worldwide [1], the same problem is faced by the newly developed countries like United Arab Emirates (UAE). Ministry of Health, UAE conducted a study on national health which revealed that approximately 33% of married women are overweight and 38% are obese, while among male gender, 40.3% married men are overweight and 15.8% are obese [2].

Bariatric surgical procedures performed annually are relatively small but number is increasing. Bariatric surgeons continue to develop safer and more efficacious procedures to battle this lethal disease. Laparoscopic Sleeve Gastrectomy, a relative new surgical approach, was initially conceived as a restrictive component of the biliopancreatic diversion and duodenal switch in the era of open bariatric surgery. With advent of minimally invasive surgery in the late 1980s, laparoscopic sleeve Gastrectomy (LSG) has been proposed as a step procedure in high-risk patients, followed by a second step Roux-en-Y gastric bypass or biliopancreatic diversion and duodenal switch and recently as a stand-alone bariatric approach.

LSG is advocated as a first step of two-stage procedure for morbid - obese patients [3]. However, recent support is mounting that continues to establish LSG as the definitive procedure for surgical treatment of morbid obesity. We found our experience with the LSG as a primary bariatric procedure and to evaluate its efficacy as a stand-alone procedure.

The aim of this study is to investigate the effectiveness of LSG as a primary procedure for morbidly obese patients along with other measures such as dietary manipulation, exercise and lifestyle modification and to have a follow up to see the effectiveness of the LSG in terms of weight loss and reduction in the risk of other consequences of obesity.

In addition to that the aim of our this study was to review over first 109 cases of LSG, regarding safety & efficacy in comparison to international standard at 3, 6 months and one year follow up.

2. MATERIALS AND METHODS

A retrospective observational study was carried out on the morbidly obese patients (n=109), who were referred from different clinics with the primary problem of obesity and consequent comorbidities. Data was reviewed for patients who underwent LSG during a period of one year from May 2011- 2012. Data collected included: demographics, preoperative work up as necessary, indication for surgery, length of hospital stay, postoperative complications, and degree of weight reduction and resolution of comorbid conditions, over a period of one year follow up. Patients with BMI more than 50, with the history of GERD, endoscopic finding suggestive of GERD or hiatal hernia are not eligible for LSG in our setting.

2.1 Statistical Analysis

Patients group are categorized on BMI (Table 1) and analysed using Statistical Package for Social
Table 1. Age group compared to BMI

| Age group | BMI: 35-40 kg/m² | BMI: 40-50 kg/m² | Total |
|-----------|------------------|------------------|-------|
| ≤ 30 yrs. | N= (%)           |                  |       |
|           | 10 (25.6%)       | 29 (74.4%)       | 39 (100.0%) |
| 31- 40 yrs. | N= (%)   |                  |       |
|           | 26 (47.3%)       | 29 (52.7%)       | 55 (100.0%) |
| 41 - 50 yrs. | N= (%) |                  |       |
|           | 5 (38.5%)        | 8 (61.5%)        | 13 (100.0%) |
| 51 - 60 yrs. | N= (%) |                  |       |
|           | 0 (0%)           | 2 (100.0%)       | 2 (100.0%) |
| Total     | N= (%)           |                  |       |
|           | 41 (37.6%)       | 68 (62.4%)       | 109 (100.0%) |

Sciences (SPSS). Multivariate analysis of factors associated with high risk for OSAS was conducted using binary logistic regression. Odds ratio and their 95% confidence intervals were reported. For continuous variables data is expressed as mean ± SD. Some independent variables were transformed as follows: BMI ≤ 30 kg/m² and ≥ 30 kg/m² & Age groups – 14 to 20, 21 to 30, 31 to 40, 41 to 50, 51 to 60 & older. A p value of <0.05 was considered statistically significant.

3. RESULTS

Out of 109 obese patients who underwent LSG, 50% are in the age group of 31- 40 years, and 36% are less than 30 years, accounting for 86% of patients less than 40 years of age and only 2 patients were of age 51 to 60 years, noticeably reflecting high prevalence in younger population in UAE.

Around 61.5% (n=67) of the patients who underwent LSG were female. Almost all of the patients were referred to dietician 98% (n=107). Co-morbidities in the group as follows: DM and HTN were present in 11% (n=12) & 8.3% (n=9) of patients respectively, 19.3% of patients had both DM and HTN as a complication of obesity and 11% (n=12) had gastritis. 53% had no significant co-morbidities.

As far as postoperative length of stay, 33% stayed in hospital for 3 days & 42% had 4 days stay post-surgery, only 7% had a longer stay of 6 days due to pain, vomiting, and delay in oral intake or early intolerance to food (Fig. 1).

In post-operative period, 95.4% (n=104) of patients had no postoperative complications and only one patient had oozing/bleeding which was controlled by conservative management e.g. blood products transfusion, observation etc. Rest of the complications as explained (Fig. 2).

4. DISCUSSION

Obesity is a growing health concern being one of the leading cause of preventable deaths in UAE. It ranks 18 on a 2007 list of fattest countries with 68.3% of its citizens with unhealthy weight [4].

![Fig. 1. Histogram showing length of stay of patients who underwent LSG](image-url)
Among UAE nationals of 14 years old, it was 2.3 fold higher for both genders though for 18 years old, it increased to 3.6 times in males and 1.9 times in females [2]. It’s happening because of sedentary lifestyle & poor dietary habits.

This situation could be alarming as it’s anticipated that number of cases will increase over the next few decades. This high prevalence of obesity in UAE may be related to cultural Influences, traditional dress in Middle East as wearing of loose flowing garments such as dish-dash or abayas for both genders. Excess weight gain goes relatively unnoticed as they are not wearing close fitting clothes. Also during summer temperature rises up to 50 degrees, outdoor activities are limited, more inactivity and boredom can lead to excessive calorie consumption resulting in weight gain [5].

A review of literature analysing data of 50 studies for LSG showed the percent excessive weight loss (% EWL) for LSG varied from 33% to 90% and appeared to be sustained up to 3 years. The mortality rate was 0-3.3% and major complications ranged from 0% to 29% (average 12.1%). Operative time ranged from 49 to 143 min (average 100.4 min). Hospital stay varied from 1.9 to 8 days (average 4.4 days) [6].

Another case-control study of 811 patients comparing the efficacy of LSG with laparoscopic Roux-en-Y gastric bypass (LRYGB) to assess results for remission of co-morbid conditions and percentage of excess weight loss after 1, 2, and 3 years revealed that LSG is an acceptable primary bariatric procedure for obesity, with results comparable or better to LRYGB in obese population [7].

A prospective cohort study of 140 patients over 12-months (95 LRYGB and 45 LSG) compared 2 surgical intervention groups to find the percentage of excess weight loss, improvement of co-morbidities, and effect on cardiovascular risk (CVR) using both the Framingham risk score (FRS) and the Registre Gironí del Cor (REGICOR) model concluded that Bariatric surgery reduces the estimated CVR by 50% at one year after surgery [8].

A retrospective analysis of 204 patients of a single surgeon operated between July 2006 and April 2010 having mean age 45 years, a mean preoperative weight 126.6 kg, and BMI of 45.7 kg/m$^2$. It concluded that LSG yields excellent outcome with low complication rate for morbidly obese patients [9].

In the present study, average Operative time was 100.4 min which was very similar to the study by Shi X, et al. [6]. In post operative period, 95.4% (n=104) patients were free of complications, rest have minor complaints and treated conservatively. This evidently reflects that LSG has less complications compared to other bariatric procedures [6]. The percent excessive weight loss (% EWL) for LSG varied from 33% to 90% and appeared to be sustained up to one year. The average weight of 109 patients before
Table 2. Follow up of patients at 3 weeks, 3, 6 and 12 months postoperatively

| Weights of patients (Kg) | N= | Minimum | Maximum | Mean ± SD |
|------------------------|----|---------|---------|----------|
| Before surgery (kg)    | 109| 83      | 163     | 121.10±16.24 |
| 3 weeks follow up      | 108| 77      | 154     | 113.09±15.51 |
| 3 months follow up     | 95 | 71      | 136     | 102.85±13.38 |
| 6 months follow up     | 92 | 64      | 120     | 91.79±11.90  |
| 1 year follow up       | 61 | 61      | 109     | 82.32±9.79 |

The surgery was 121±16 kg (mean ±SD) and 3 weeks postoperatively 113±16 kg (mean ±SD). The average weight at 3 months postoperatively 103±13 kg (mean ±SD), at 6 months 92±12 kg (mean ±SD) and at 1 year was 82±10 kg (mean ±SD). At one year, 69% achieved 10-15 units reduction in BMI and 28% have more than 15 unit reduction of BMI, so follow up of patients showed gradual decline of body weight and BMI over a one year period. Our findings are consistent with other studies for LSG [8] (Table 2 above).

As far as postoperative length of stay, 33% patients stayed in the hospital for 3 days & 42% for 4 days. Only 7% had longer stay of 6 or more days post-surgery.

According to data from Royal Alexandra Hospital, the estimated cost of LSG is $10,317, of LAGB ($7,536) and LRYGB ($11,666) [6]. The cost for LSG operation per patient in UAE is average 5267 USD which is less compare to many other countries.

5. CONCLUSION

Bariatric surgical procedure is popular in Middle East, Europe & USA. After LSG, profound changes in anatomy/physiology occur that are responsible for dramatic loss of weight, hence achieving the goal with minimal invasive procedure.

However during early and late post-operative period it can have negative impact by virtue of altered nutrient absorption. LSG is an accepted first step procedure for the surgical management of morbid obesity with BMI 35-50 kg/m². It is gaining popularity as a primary, staged and revision operation for its proven safety and simplicity as well as short-term and mid-term efficacy. Excess weight loss and remission of comorbidities have been reported to take place in a frequency comparable with other well-established procedures. Despite all of above-mentioned factors, larger series of studies are required to document the efficacy/side effects and long term results.

CONSENT

All authors declare that written informed consent was obtained from the patient (or other approved parties) for publication of this paper and accompanying images.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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