



Outcome of Laparoscopic Sleeve Gastrectomy for Treatment Morbidly Obese Patients in Srinagarind Hospital

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Abstract

Background : Laparoscopic sleeve gastrectomy (LSG) has been increasingly popular procedure for treatment morbidly obese patients and showing good weight loss and resolution of comorbidity diseases. The objective of this study was to evaluate postoperative outcome in term of operative complication, weight loss and comorbidity improvement after laparoscopic sleeve gastrectomy.

Methods : From July 2011 to December 2014 there is 70 patients (45 woman; 64 percent) with an average age of 37.7 years (range; 17-62 years), mean body weight was 126.5 kg (range; 83-250 kg), mean BMI was 45.7 kg/m² (range; 33-77 kg/m²) who underwent laparoscopic sleeve gastrectomy for treatment morbid obesity. Postoperative time, 1st day postoperative pain, postoperative complication and postoperative follow up data for the body weight change, percent EWL, BMI and improvement of comorbidity at the 6th, 9th, 12th, 18th, and 24th months were recorded.

Results : The mean operative time was 75 minutes. The mean operative blood loss was 20 ml. The mean 1st day postoperative pain score was 4. No conversion to laparotomy had to be performed. The mean percentages of excessive body weight loss (EWL) were 46.78 percent at 6 months, 59.75 percent at 1 year, 64.53 percent at 18 months, and 62.92 percent at 2 years. The mean BMI were 35.57 kg/m² at 6 months, 32.69 kg/m² at 1 year, 29.23 kg/m² at 18 months, and 29.45 kg/m² at 2 years. The rate of resolution of OSA was 65.7 percent and improvement of OSA was 31.4 percent. The rate of resolution of hypertension was 68.9 percent and improvement of hypertension was 31.1 percent. The rate of resolution of DM was 70 percent and improvement of DM was 30 percent. The rate of postoperative complication was 4.2 percent.

Conclusions : Laparoscopic sleeve gastrectomy is safe and effective procedure for treatment morbidly obese patients. However, weight regained need to evaluated in long term follow up.

Keywords : *Laparoscopic, Sleeve gastrectomy, Morbid obesity*

1. Introduction

The worldwide prevalence of obesity is increasing in adult and pediatric populations. Morbidly obese patients have a high risk of comorbidity diseases (diabetes, hypertension, sleep apnea, etc.) and decrease quality of life.^{1,2,3,4}

Today, Bariatric surgery has been the only effective treatment for morbid obesity in term of long term sustained weight loss and significantly improvement of in the obesity related comorbidity diseases. Indications for bariatric surgery were:^{5,6,7}

- BMI > 40 kg/m².
- BMI > 35 kg/m² with comorbidity disease such as diabetes, hypertension, dyslipidemia, obstructive sleep apnea, etc.
- Patient must understand and accept postoperative diet control and eating habit. Diet program was planned and evaluated by nutritionist and dietitian in our institute before and after surgery.
- Patient was evaluated and controlled comorbidity by specialists such as cardiologist, endocrinologist, psychiatrist, chest medicine and sleep medicine specialist before surgery.

Studies have shown that for a given BMI, Asians generally have a higher percentage of body fat than Europeans. Asian populations have also been shown to have elevated risks of type 2 diabetes, hypertension and hyperlipidemia at a relatively low level of BMI. Therefore, Asian Pacific Bariatric Surgery Group (APBSG), which was founded in 2004 and officially changed its name to Asian Pacific Metabolic and Bariatric Surgery Society (APMBSS) in 2008, held a consensus meeting in 2005 and modified the indication for bariatric surgery for Asian. Consensus in Asia-Pacific (2005)⁸ were:

- Obese patients with a BMI >37 kg/m².
- Obese patients with a BMI >32 kg/m² and the presence of diabetes mellitus or two significant obesity related comorbid diseases.

Although a number of surgical techniques exist, laparoscopic Roux-en Y gastric bypass (LRYGB) is currently standard treatment and the most common procedure across the world.^{4, 9} However, LRYGB is difficult to perform in superobese and high risk patient and cause malnutrition after operation. Laparoscopic sleeve gastrectomy (LSG) has emerged as the first step of LRYGB, and may advantage in superobese patients because it doesn't cause malnutrition after operation.

Some authors described laparoscopic sleeve gastrectomy (LSG) as a stand-alone operation for treatment of morbid obesity. It is a purely restrictive procedure, good result to reduce weight in long term and improvement of comorbid diseases.¹⁰

The aim of this study was to analyze the short term and intermediate outcome of LSG in term of operative time, postoperative complication, weight loss and improvement of comorbid diseases.

2. Materials and Methods

Preoperative care

We selected obese patients who wanted to lose weight and met the criteria of bariatric surgery underwent laparoscopic sleeve gastrectomy. We admitted the patient to prepare for surgery and checked preoperative laboratory. We injected enoxaparin as an anticoagulation dose 0.4-0.6 ml intravenous 12 hrs before surgery, and applied sequential compressive device (SCD) during surgery to prevent

deep vein thrombosis (Figure 1). The operative position is reverse Trendelenburg position (Figure 2).



Figure 1. Apply SCD and feet support during operation



Figure 2. Patient position is in reverse Trendelenberg position

The operation started with 5 trocar ports insertion under vision size 12 mm at left and right 2-3 cm from midline above umbilicus (Figure 3). First, we preserve antrum of stomach 6 cm proximal to pylorus and start the dissection of greater curvature of stomach up to angle of His from this point. Second, we insert Savaly Gillard dilator 38 French from the patient's mouth into stomach along the lesser curvature to controlled vertical gastrectomy. Third, we cut stomach 1 cm lateral to Savaly Gillard dilator by Endo stapler to make stomach like a tube or sleeve (Figure 4). Finally, we remove greater curvature of stomach and check bleeding from gastric sleeve.^{1,7,9,10}

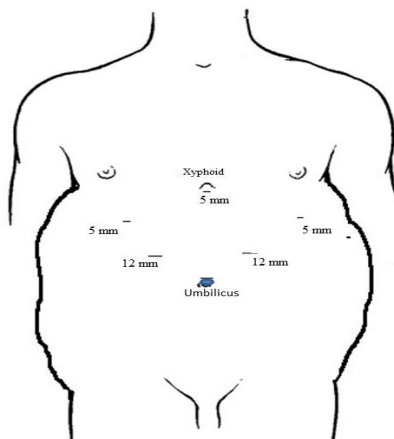


Figure 3. Ports position

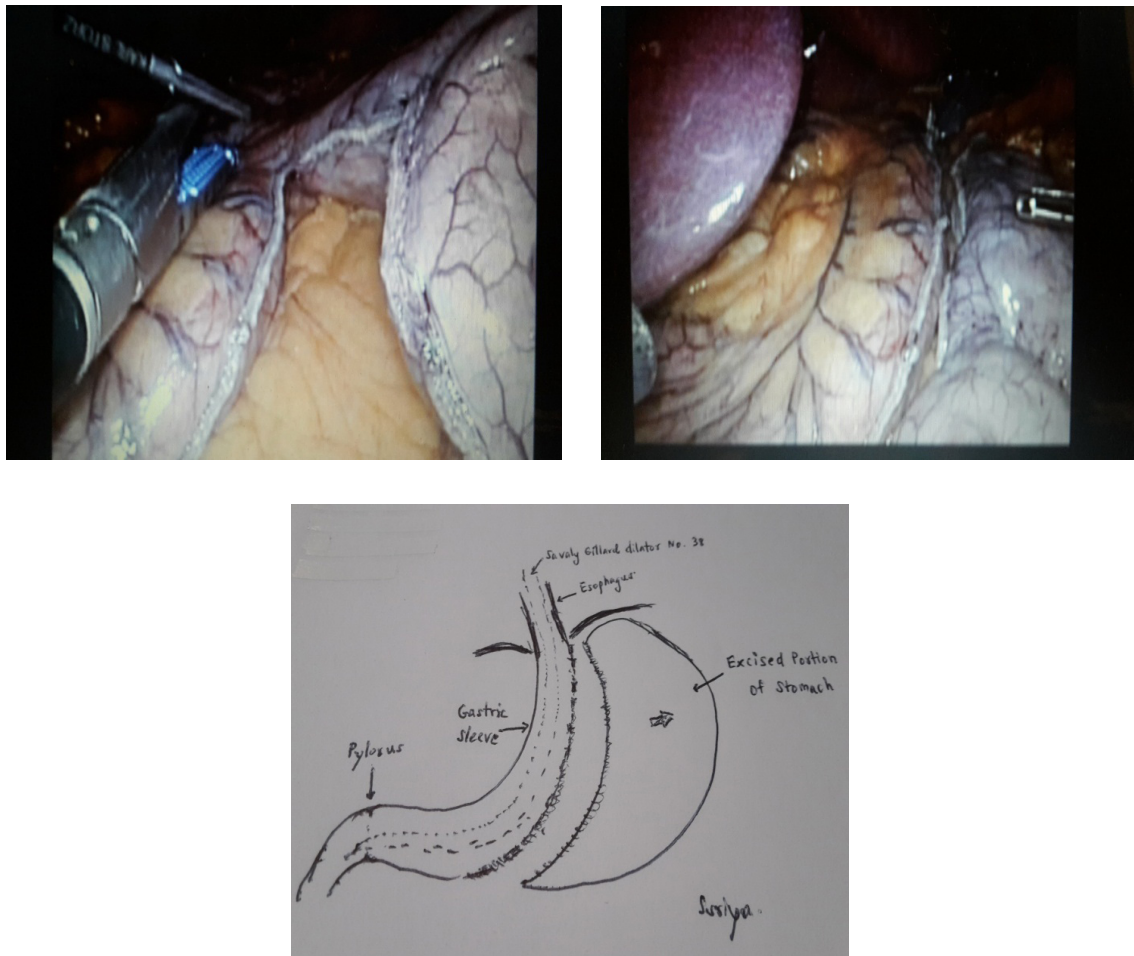


Figure 4. Sleeve gastrectomy

Postoperative Care

After operation, we injected intravenous morphine 4 mg every 4 hours in first day and the patient can't eat or drink anything (NPO) for 1 day then they can step diet after that if they don't have any signs of leakage. We discharge patient if they can eat and drink well and make an appointment for patient to follow up at 1 week, 1 month and every 3 months after surgery.

Statistical Analysis

Descriptive statistics were made using mean and percentage of cases to compare preoperative and postoperative outcomes.

3. Results

From July 2011 to December 2014 there is 70 patients (45 women; 64 percent) with average age of 37.7 years (range; 17-62 yr) were performed laparoscopic sleeve gastrectomy (LSG) in Srinagarind Hospital, Department of Surgery, Faculty of Medicine, Khon Kaen University.

The mean body weight was 126.5 kg (range 83-250 kg) and mean BMI was 45.7 kg/m² (range; 33-77 kg/m²). Eighty percent of patients (56 cases) have comorbidity diseases such as obstructive sleep apnea

(OSA) 49 cases (70 percent), hypertension 42 cases (60 percent), dyslipidemia 35 cases (50 percent) and diabetes mellitus 23 cases (33 percent) (Table.1).

Table 1. Patient characteristics

Variable	Value
Total patients; number	70
Male; number(percent)	45 (64)
Female; number(percent)	25 (36)
Mean age; years (range)	37.7 (17-62)
Mean BW; kg (range)	126.6 (83-250)
Mean BMI; kg/m² (range)	45.7 (33-77)
Comorbid diseases; number (percent)	56 (80)
Obstructive sleep apnea; number (percent)	49 (70)
Hypertension; number (percent)	42 (60)
Dyslipidemia; number (percent)	35 (50)
Diabetes mellitus; number (percent)	23 (33)

The mean operative time was 75 minutes (range; 50-120 minutes). The mean operative blood loss was 20 ml (range; 5-100 ml) and all of the patients didn't need perioperative blood transfusion. No conversion to laparotomy had to be performed. The mean 1st day postoperative pain score was 4 (range; 3-8) and mean total morphine usage was 30 mg (range; 24- 48 mg).The mean hospital stay was 5 days (range; 3-20 days).

We have postoperative complications in 3 patients (4.2 percent). One patient had wound infection treated with wound dressing. One patient had gastric sleeve

leakage but we could treat successfully with endoscopic stent placement. One patient had ulcer at EG junction and causing upper GI bleeding but we can treat with endoscopic adrenaline injection. There was no mortality in our series.

Weight loss and BMI results:

The mean BMI were 35.57 kg/m² at 6 months, 32.69 kg/m² at 1 year, 29.23 kg/m² at 18 months, and 29.45 kg/m² at 2 years (Figure 5).The mean percentages of excessive body weight loss (EWL) were 46.78 percent at 6 months, 59.75 percent at 1 year, 64.53 percent at 18 months, and 62.92 percent at 2 years (Figure 6).

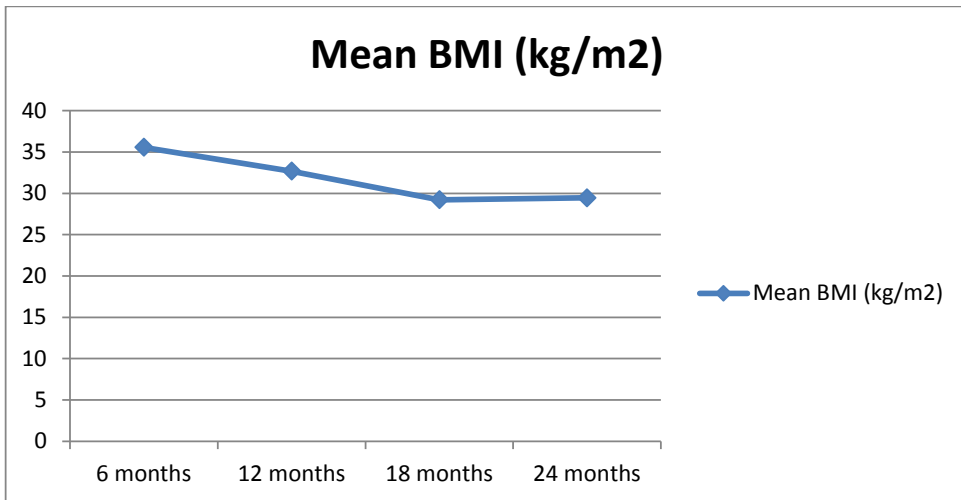


Figure 5. Mean BMI after LSG



Figure 6. Percent Excessive Weight Loss after LSG

Comorbidity complete recovery results in 1 year after surgery:

Complete recovery means returning to a normal condition and level of blood pressure, lipid profile and glucose level, and patients don't use any medications. Improvement means the diseases controlled with less medications and not improvement means the diseases still uncontrolled

treatment or use the same amount of medications. In our study, the rate of complete recovery of obstructive sleep apnea (OSA) was 65.7 percent and improvement of OSA was 31.4 percent. The rate of complete recovery of hypertension (HT) was 68.9 percent and improvement of HT was 31.1 percent. The rate of complete recovery of dyslipidemia (DLD) was 71.4

percent and improvement of DLD was 28.6 percent. The rate of resolution of diabetes mellitus (DM) was 70 percent and

improvement of DM was 30 percent (Figure 7).

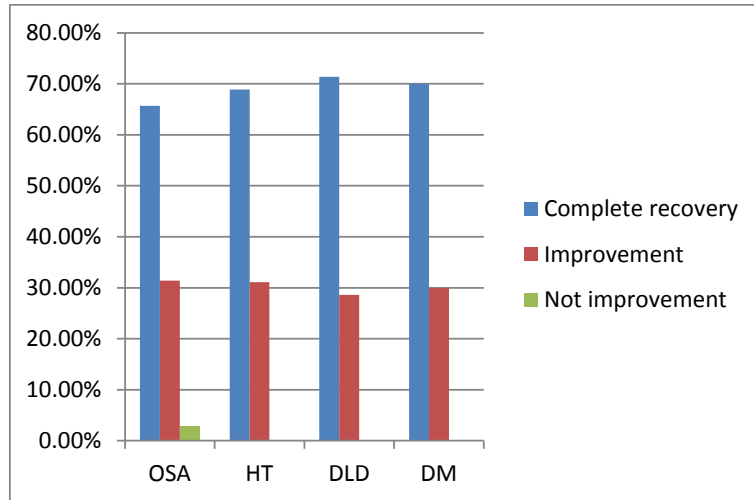
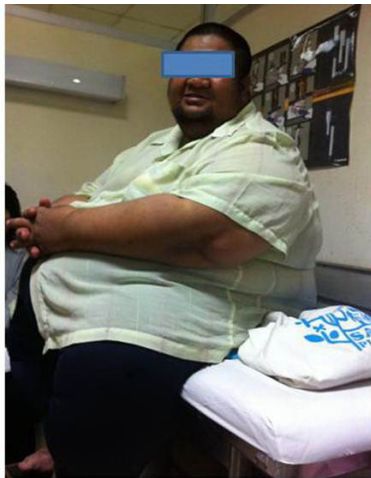


Figure 7. Improvement of comorbidity after LSG



Before surgery: 250 kg



2 yrs after surgery: 140 kg

Figure 8. Patient before and after LSG

4. Discussion

Laparoscopic sleeve gastrectomy (LSG) has been introduced as a very popular bariatric procedure. LSG achieves weight loss by restricting the amount of

food that can be consumed, without malabsorption syndrome.^{4,11,12,13}

Melissas³ reported the result of LSG after 2 years follow up, founded a mean percent excessive weight loss (EWL) of 71.16 percent and significantly

decreases BMI and appetite. But some patients have gastroesophageal reflux disease (GERD) after surgery. Baltazar¹⁴ reported a mean % EWL after follow up 4 to 27 months were 56.1 percent (46-66 percent) in super-obese patients (BMI > 60 kg/m²) and 59.5 percent in BMI >40 kg/m² but less than 60 kg/m². Nocca⁷ showed the percentage of loss in EWL was 61.52 percent at 2 years. Shi⁴ reviewed the result of Bariatric procedures (LAGB, LRYGB and LSG) founded percent EWL at 3 years were 55 percent, 66 percent and 66 percent respectively and resolution of comorbidity were 41-59 percent, 65-84 percent and 45-95.5 percent respectively.

The results of our study show the mean percentages of EWL were 59.75 percent at 1 year and 61.92 percent at 2 years and the result is comparable with other studies. The resolution of comorbidity after 1 year follow up show the rate of improvement and complete recovery of OSA, HT and DM were 97.1 percent, 100 percent and 100 percent respectively. The resolution of comorbidity data is very good result and can improve quality of life of patients. Our study does not have conversion and mortality rate.

However we have postoperative complications in 3 patients (4.2 percent). One patient had wound infection at removed specimen port site and treated with wound dressing. The wound completely healed within 1 week postoperatively. We would suggest using skin protection when removing excised portion of stomach and cleaning with normal saline or antiseptic before wound closure.

One patient had ulcer at EG junction and causing upper GI bleeding. The patient came to the hospital 3 day postoperatively with hematemesis and passed melena.

We treated with endoscopic adrenaline injection. The bleeding was stopped and the patient discharged 3 days later. From endoscopic finding, the ulcer might happened due to Savaly Gillard dilator scraped when passing through the EG junction. We would suggest using soft dilator such as Malony dilator or using endoscope pass into the stomach to prevent ulceration.

One supermorbid obesity patient had gastric sleeve leakage at proximal part of stomach near EG junction due to incomplete firing of stapler and difficulty of operation. We repair that part with laparoscopic suturing. Postoperative day 2nd, the patient had tachycardia with heart rate of 140 beat per minute. The patient ingested methylene blue solution then we detected blue color fluid from drain. We could treat successfully with endoscopic stent placement. We would suggest firing stapler leave 2 cm from Angle of His and don't have more tension. Early detection and treatment is the key of management. Tachycardia or heart rate more than 120 beat per minute is the first sign of postoperative complications such as bleeding or leakage.

However weight gains and GERD after LSG should be evaluated and followed up in a long term period after 2 years.

5. Conclusion

The laparoscopic sleeve gastrectomy is a safe and effective bariatric procedure to treat morbid obesity patient. The operation can improve or resolve morbid obesity related comorbidity diseases and improve quality of life. However, weight gain in a long term followed up is needed to be evaluated.

6. References

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