

## Invaginating Oversewing Of The Staple Line Versus Non-Oversewing During Laparoscopic Sleeve Gastrectomy For Treatment Of Obesity

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**Abstract: Introduction:** Laparoscopic sleeve gastrectomy (LSG) has become a very frequent procedure in bariatric surgery. It has erroneously been considered simple and easy which led to its adoption by a large number of surgeons. Staple line leaks, bleeding, and strictures are the commonly reported complications following LSG. **Aim:** compare the outcome of invaginating oversewing of the staple line versus non-oversewing during laparoscopic sleeve gastrectomy as regards the incidence of postoperative leakage, stricture, and the total outcome in both techniques. **Material & methods:** A randomized controlled trial (RCT) of 40 patients who underwent LSG for obesity at Al-Hussien university hospital between May 2015 and April 2017. Patients were assigned to one of two groups: the invaginating oversewing group or the non-oversewing group. The primary outcome was reoperation for hemodynamic instability caused by staple-line bleeding or leak during the early postoperative stay. The secondary outcomes were operative duration, length of hospital stay, postoperative stenosis, and the total outcome of both operations. **Results:** we had two cases of leak in the non-reinforcement group one undergoing surgery and the other followed up conservatively with no major complications in the oversewing group **Conclusion:** invaginating oversewing of the staple line during sleeve gastrectomy decreases the post operative leak and bleeding rates.

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**Keywords:** Sleeve gastrectomy, leak, oversewing

### 1. Introduction

Obesity is a global health problem that requires a multidisciplinary treatment including specialists in mental health, medicine and surgery. It leads to a significant increase in morbidity and mortality and consequently reducing quality of life (1). Laparoscopic sleeve gastrectomy (LSG) is a surgical approach to treat morbid obesity. It restricts the stomach's size to induce satiety and resects fundal ghrelin-producing cells to decrease appetite. LSG has become a very frequent procedure in bariatric surgery, due to its simplicity (2). For adults with a BMI >40 kg/m<sup>2</sup> or a BMI >35 kg/m<sup>2</sup> with obesity-related conditions who fail to respond to behavioral treatment (with or without pharmacotherapy) with sufficient weight loss to achieve targeted health outcome goals, bariatric surgery might be an appropriate option to improve health (3). Staple line leaks, bleeding, and strictures are the commonly reported complications following LSG. Based on the data of 12799 LSGs, the International Sleeve Gastrectomy Expert Panel Consensus Statement 2011, the leak rate was 1.06% (4). Despite advances in surgical stapling technology,

rates of bleeding and leakage are about 1–5%, and more than 3% of LSG patients require reoperation (5). These outcomes led to the concept of reinforcement of the staple line. Of the current methods of staple-line reinforcement, oversewing is one of the most popular among bariatric surgeons (6). The aim of this prospective study is to compare the outcome of invaginating oversewing of the staple line versus non-oversewing during laparoscopic sleeve gastrectomy as regards the incidence of postoperative leakage, stricture, and the total outcome in both techniques.

### 2. Patients and Methods

This study was conducted from May 2015 to April 2017 with forty morbidly obese patients randomly enrolled. The inclusion criteria were be: age range will be 17~ 60 years, BMI more than 40 or more than 35 with co-morbidity, failure of non-surgical treatment, and absence of endocrinal or psychological disorders. The exclusion criteria were be: patients less than 17 years or more than 60 years, BMI less than 40 or less than 35 without co-morbidities, good response to non-surgical treatment,

presence of endocrinal or psychological disorders, and bad general condition of the patient.

All patients were subjected to:-

Full history and clinical examination.

Laboratory investigations for preoperative evaluation including CBC, PT, liver functions, kidney functions, and hormonal profile (FBS, Serum Cortisol, T3, T4, TSH).

Radiological investigations including chest X-ray, Abdominopelvic ultrasound, CT may be ordered in selected patients.

Evaluation of the cardiac and respiratory condition in the form of ECG, Echocardiogram, and respiratory function tests.

All patients had a written informed consent of the different types of laparoscopic procedures of obesity and the difference between laparoscopic sleeve gastrectomy with and without invaginating oversewing of the staple line and the additive cost. Only patients who choose laparoscopic sleeve gastrectomy of either type were included in the study.

Prophylactic anticoagulant medications were given to all patients in the form of subcutaneous Clexane® 0.5 unit/Kg/24 hours which started 12 hours preoperatively then stopped for 12 hours after operation to ascertain haemostasis. After confirmation of haemostasis the therapy was resumed for the following 10 days.

An ICU bed was reserved for all patients the night of operation with the decision of transfer left to the postoperative recovery assessment.

According to the patient selection, all forty patients were divided in two comparative groups as follow.

Group A) Twenty patients submitted to laparoscopic sleeve gastrectomy with routine invaginating oversewing stitches of the staple line with absorbable sutures.

Group B) Twenty patients undergone standard sleeve gastrectomy without invaginating stitches.

A completion methylene blue test was done in both groups intraoperatively while gastrograffin swallow was done on 2<sup>nd</sup> ~ 4<sup>th</sup> postoperative days.

After discharge, patients were followed for up to two years on monthly based visits including patient complains, weight assessment, at 3, 6, 12, 18, and 24 months. Contrast radiological, assessment ultrasound, or CT was ordered according to the patient symptoms and necessity.

All patients were discharged with written instructions of postoperative diet regimen as follows:

-Plenty oral fluids for 10 days.

-Semisolid diet for 2 weeks.

-Multiple small normal meals afterwards.

### 3. Results

All patients enrolled in our study were submitted to LSG. The mean age of our patients was  $32 \pm 8$  years; mean BMI was  $52.5 \pm 8.09$ ; mean hospital stay was  $5 \pm 2$  days. Mean total operative time was  $141 \pm 36$  minutes which was significantly longer in group A compared with group B. Three major complications were observed (7.5 %): two leaks and one gastric volvulus in group B. The two leaks were diagnosed in the first week postoperatively by swallow studies. The first case underwent open exploration and repair of a small leak site opposite the antrum was done. The second case was followed up conservatively with no exploration needed with the drain left for a longer period with regular 3 cm withdrawal of the drain on weekly based visits. The patient with the gastric volvulus was presented with recurrent vomiting not responding to medical treatment. radiological investigations diagnosed volvulus of the sleeve and mega stent was inserted. One of our patients developed calcular gall bladder which was removed laparoscopically with no complications. No mortality was observed.

### 4. Discussions

There is no evidence about staple line reinforcement during laparoscopic sleeve gastrectomy. It is debatable although it is recommended many surgeons. Oversewing of the stable line increases the operative time and is dependable on the surgeon's learning curve.

In a recent article, Dapri et al. randomly compared three different groups with a total of 75 patients: no SLR (group 1), buttressing of the staple line with Gore Seamguard® (group 2), and staple line suturing (group 3). In their experience, Seamguard® reduced blood loss during stomach sectioning, but there were no significant differences in terms of postoperative leaks between the three techniques (6). Varban OA et. al. stated that the only technique specific factor associated with a reduction in leaks was oversewing of the staple line. However, surgeons who oversewed routinely also had higher case volumes and lower nonleak complication rates, suggesting that oversewing may simply be a marker for surgeon experience or skill (7). Although most of the studies attempt to elucidate best practices for performing sleeve gastrectomy, they fail to consider differences in patient populations, surgeon skill, evolution of technique, and learning curves. Some studies are also marred by industry sponsorship aimed to promote the benefits of a product, so it may be sold (7).

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