



E-ISSN: 2616-3470  
P-ISSN: 2616-3462  
© Surgery Science  
www.surgeryscience.com  
2019; 3(2): 125-127  
Received: 06-02-2019  
Accepted: 10-03-2019

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## Effects and results of fibrin sealant use in laparoscopic sleeve gastrectomy

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DOI: <https://doi.org/10.33545/surgery.2019.v3.i2c.23>

### Abstract

**Background:** Leakage and bleeding after LSG are very serious feared complications. The aim of this study was to review the clinical evidence after using fibrin sealant in standard LSG.

**Methods:** Morbidly obese patients who underwent standard technique of LSG with using fibrin sealant were included in the study. Data concerning patient demographic variables [age, gender, body mass index (BMI, kg/m<sup>2</sup>), and comorbid conditions], previous surgeries, postoperative complications and postoperative readmissions were collected.

**Results:** In total, 100 patients who underwent LSG, 51.6 % of the patients had obesity-related comorbid conditions with a BMI >35 kg/m<sup>2</sup>. The mean age of the patients was 42 ± 13 years. All operations were completed laparoscopically. The mean operative time was 60 ± 12 min. No leakage was detected in the intra-operative methylene blue test. The mean hospital stay was 5 ± 2 days. Staple-line leakage, twist and stricture were not observed. No mortality were noted.

**Conclusion:** This retrospective study shows that bariatric surgeons should consider using standard surgical surgery in LSG to reduce postoperative complications. Fibrin glue is a reliable and useful tool for strengthening the staple line and can prevent potential twist of the stomach.

**Keywords:** Evaluating pregnancy outcome PCOS patients, bottom line truth, modern lifestyle

### Introduction

In recent years, bariatric and metabolic surgeries have been increasingly used to reduce obesity-related comorbidities and for weight loss. Bariatric surgery is applied to patients with a body mass index of 40 kg / m<sup>2</sup> or BMI ≥35 with diabetes, ht, dyslipidemia and sleep apnea. LGS (Laparoscopic sleeve gastrectomy), which is one of the bariatric surgical methods, is a simple technique and has a shorter learning curve and is a widely used surgical method for the treatment of morbid obesity [1, 2, 3]. The most important complication is the presence of bleeding and leakage in the stapler line in the postop period due to increased intragastric pressure [4, 7, 8]. The reported incidence of leak after LSG varies between 0% and 5.5% and patients with leaks are prone to local or systemic severe complications [5, 6]. Prevention of leaks in patients undergoing LSG is of significant importance with regard to reducing mortality and morbidity as well as reducing the costs associated with the treatment of leaks [4]. Materials and methods that can be used to reduce the risk of leaks are still a matter of discussion [10]. Materials that have been previously used for the reinforcement of the staple line include bioprosthetic materials such as fibrin glue or bovine pericardium strips or absorbable polymer membranes [10, 11, 12]. However, there are very few studies examining the relative efficacy of these methods in reducing the leak risk [12]. In this study, we retrospectively reviewed efficacy of tisseel tissue glue to prevent bleeding and stapler line.

### Material and Method

In our study, 100 patients who underwent LGS in General Surgery Clinic of S.B.Ü Van Training and Research Hospital between January 2015 and June 2018 were retrospectively assessed. Informed consent was obtained from all patients. Data concerning patient demographic variables [age, gender, body mass index (BMI, kg/m<sup>2</sup>), and comorbid conditions], previous surgeries, postoperative complications and postoperative readmissions were collected. In order to prevent thrombo-embolism, all patients were administered 1-2 mg / kg subcutaneous low-molecular-weight heparin before and after surgery. Standard LSG was performed and all patients were

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sprayed with two 4ml boxes of human fibrin sealant (Tissel™, Boxter @ deerfield, IL, USA) along the suture line.

In the first follow-up month, complications were determined. Continuous variables were expressed as the mean  $\pm$  standard deviation. Categorical variables were expressed as frequencies. After surgical cessation of the stomach with the help of laparoscopic staplers throughout the large curvature during the standard LSG operation as a surgical procedure two boxes (8 ml) of human fibrin sealant was sprayed with a special laparoscopic set along the stapler line to provide hemostasis, sealing and adhesion.

## Results

Of the 100 patients who underwent LSG, 51.6 % of the patients had obesity-related comorbid conditions with a BMI  $>35$  kg/m<sup>2</sup>. The mean age of the patients was  $42 \pm 13$  years. Demographic and anthropometric variables and types of comorbid conditions are provided in Table 1. All operations were completed laparoscopically. The mean operative time was  $60 \pm 12$  min. No leakage was detected in the intra-operative methylene blue test. The mean hospital stay was  $5 \pm 2$  days.

Postoperative complications are shown in Table 2. One patient presented with abdominal pain after discharge and was treated with medical treatment. The patient did not require any intervention and there was no mortality. The bleeding rate was 1%, and bleeding was spontaneously stopped by clinical follow-up. On postoperative day 6, the patient was discharged. There were no other complications in the first follow-up period of all operated patients.

**Table 1:** Characteristics and preoperative comorbidities of patients undergoing LSG

Demographics	Value
Age <sup>a</sup>	42 $\pm$ 13
Gender	
• Male <sup>b</sup>	41
• Female <sup>b</sup>	59
Body Mass Index <sup>a</sup>	41 $\pm$ 10
Comorbid conditions <sup>b</sup>	
• Diabetes mellitus <sup>b</sup>	27
• Arterial hypertension <sup>b</sup>	31
• Obstructive sleep apnea <sup>b</sup>	13
• Hyperlipidemia <sup>b</sup>	10
Anticoagulant use <sup>b</sup>	2

<sup>a</sup> Mean  $\pm$  standard deviation, or percentage

<sup>b</sup> n (%)

**Table 2:** Postoperative outcomes

Operative time (min) <sup>a</sup>	60 $\pm$ 12
Hospital stay (day) <sup>a</sup>	5 $\pm$ 2
Complications	1
• Bleeding <sup>b</sup>	0
• Leakage <sup>b</sup>	0
• Stricture <sup>b</sup>	0
• Twist <sup>b</sup>	0
• Pulmonary embolism <sup>b</sup>	0
Re-operation <sup>b</sup>	0
Mortality <sup>b</sup>	0

<sup>a</sup> Mean  $\pm$  standard deviation, or percentage

<sup>b</sup> n (%)

## Discussion

Bariatric surgery, especially sleeve gastrectomy, obesity and related diseases caused by obesity-related deaths has been

reduced [1, 13, 14]. LSG is associated with post op increased intragastric pressure and we believe that fibrin adhesive materials reduce the rate of leakage by increasing resistance to this increased pressure [4]. Today, the LSG has become comparable with other procedures with its advantages and effective results. However, a very serious complication may occur due to the surgical technique. All surgeons aim to reduce the risk of complications; therefore, most surgeons use various materials to provide hemostasis and strengthen the staple line. But no material was used to prevent gastric tube rotation and / or stricture [1]. In our standard technique, if the stomach divided straight and human fibrin sealant was sprayed on the staple line, left crus of the diaphragm and posterior of the stomach, then the surrounding tissues adhered to the gastric tube. In the literature, the rate of staple-line leak and stricture following LSG ranged from 0-4.2% [15, 16, 17], and 0-2.1% [18, 19, 20]. These complications were shown as the major cause of mortality and morbidity. Bleeding, which is another complication observed after LSG, has been shown to vary between 1.7% and 13.7% in the literature [20, 21, 22]. Numerous options to prevent bleeding according to our findings, abdominal hemorrhage after LSG should be followed carefully with proper hydration, including erythrocyte suspensions and. Hemodynamically stable patients should not be in a hurry for surgery as much as possible. However, patients who do not achieve hemodynamic improvement despite appropriate hydration and ES replacement should be operated [1]. So why do we use tissel. Tisseel may be dissolved after a while and its contents partially prevent the bleeding. We did not use this agent to prevent leakage directly. However, we think that Tissel helps to prevent leaks by allowing the omentum to stick to the stapler line with the effect of tissue adhesive. Our study is a retrospective study and it is a limited study because there are no comparative control groups. We also think that the number of patients is insufficient to achieve statistically significant results. We think that more comprehensive studies are needed.

## Conclusion

Various approaches to reduce the complication rate; synthetic or biological reinforcement materials have been used but there is no consensus on this subject. Fibrin sealant is a reliable and useful tool to reinforce the staple line and may prevent twists in the sleeved stomach.

## Compliance with ethical standards

**Disclosures:** Dr. Muzaffer Önder Öner and Dr. Mehmet Kadir Bartın have no conflicts of interest or financial ties to disclose.

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