

Original Research Article

Management of sleeve gastrectomy leakage with endoscopic stenting

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Received: 22 January 2019

Accepted: 07 February 2019

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ABSTRACT

Background: Sleeve gastrectomy is one of the most commonly applied procedures for obesity surgery. Leakage from the stapler line and bleeding are the most important complications of sleeve gastrectomy. This study aimed to report the results of esophageal stent procedure applied to cases who developed leaks after sleeve gastrectomy.

Methods: This study included patients who had sleeve gastrectomy due to morbid obesity and were detected to have a leak after the procedure. Demographic features, time of leakage after the surgery, and the management of the leak were analyzed.

Results: it was detected in this study, 1220 cases who had sleeve gastrectomy for morbid obesity. Leaks were developed in 10 patients after Laparoscopic Sleeve Gastrectomy (LSG). Four patients, followed conservatively without stent application, were excluded. Six patients, treated with stent application, were included. Two of the patients were males, and four were females (M/F=1/2). The mean age was 38.3 (\pm 11.57) (range: 26-58). The mean body mass index was 43.26 (\pm 2.10)kg/m². The incidence of a leak was 0.81%.

Conclusions: In a conclusion, stents can be safely applied by experienced endoscopists for the management of sleeve gastrectomy leakage.

Keywords: Bariatric surgery, Complication, Leakage, Obesity, Sleeve gastrectomy, Stent

INTRODUCTION

Obesity is one of the most important health problems of our age. The prevalence of obesity is increasing all over the world.¹ Obesity is among the leading causes of preventable death in developed countries. Morbid obesity is defined as a body mass index (BMI) of more than 40kg/m². Obesity is the cause of many systemic diseases. It causes serious psychosocial and medical problems. The success of diet, exercise and medical treatments in obesity treatment is limited. Surgery is becoming increasingly more important for the treatment of obesity. Sleeve gastrectomy is one of the most commonly applied procedures for obesity surgery.^{2,3} Leakage from the

stapler line and bleeding are the most important complications of sleeve gastrectomy.⁴ Leakage increases both morbidity and mortality significantly.⁵ The main factor blamed from leakage is micro perforations after ischemia of the staple line. The leakages generally present with the complaints of tachycardia, abdominal pain, high fever, hypotension, and nausea. Early diagnosis and intervention are crucial in leak management. Intraabdominal abscess and fluid collection forms detected by imaging methods may be treated with catheter drainage which is applied with laparoscopic guidance. Esophageal stent application may be beneficial for patients who don't respond to drainage and antibiotic therapy. This study aimed to report the results of

esophageal stent procedure applied to cases who developed leakage after sleeve gastrectomy.

METHODS

The cases of patients diagnosed with adolescent obesity at Elazığ Medical Park Hospital’s General Surgery Clinic in Elazığ, Turkey from January 2016 to January 2019 were studied retrospectively.

The conditions of all the patients who were diagnosed with leakage after sleeve gastrectomy. This study included patients who had sleeve gastrectomy due to morbid obesity and were detected to have a leakage after the procedure. The patients in this study were evaluated by surgeon before endoscopic stenting. Primarily, conservative treatment were applied. Endoscopic stenting were decided upon if conservative treatment were seen to be ineffective. Four patients who were followed conservatively without stent application after leakage were excluded. A total of six patients with endoscopic stenting were followed up and treated at the clinic within the specified time period. Demographic features, time of leakage after the surgery, and the management of the leak were analyzed.

The data of patients with endoscopic stenting after leakage who had undergone sleeve gastrectomy for morbid obesity between January 2016 and January 2019 were retrospectively evaluated. Demographic characteristics, preoperative body mass indexes (BMIs), leakage detection time, stent removed time, complications and additional interventions were evaluated. The data were collected in the database related to this purpose and the results were statistically analyzed.

Statistical analysis

Statistical analysis was performed using the SPSS Statistics software package, version 20 (IBM Corp. in Armonk, NY). Descriptive data were presented as frequencies (n) and percentages (%) for categorical variables, and as the mean or median range for non-normally distributed numerical variables.

RESULTS

The patients who had sleeve gastrectomy for morbid obesity in our clinic between December 2016 and January 2019 were retrospectively screened from the hospital database. We detected 1220 cases who had sleeve gastrectomy for morbid obesity. Leaks were developed in 10 patients after Laparoscopic Sleeve Gastrectomy (LSG). Four patients, followed conservatively without stent application, were excluded (Figure 1). Six patients, treated with stent application, were included. Two of the patients were males, and four were females (M/F=1/2). The mean age was 38.3 (±11.57) (range: 26-58). The mean body mass index was 43.26 (±2.10) kg/m² (Table 1). The incidence of a leak was 0.81%. The earliest leak was detected on 9th day. The latest leak was detected on 90th day. The mean leak detection time was 33.6 (±30.19) days.

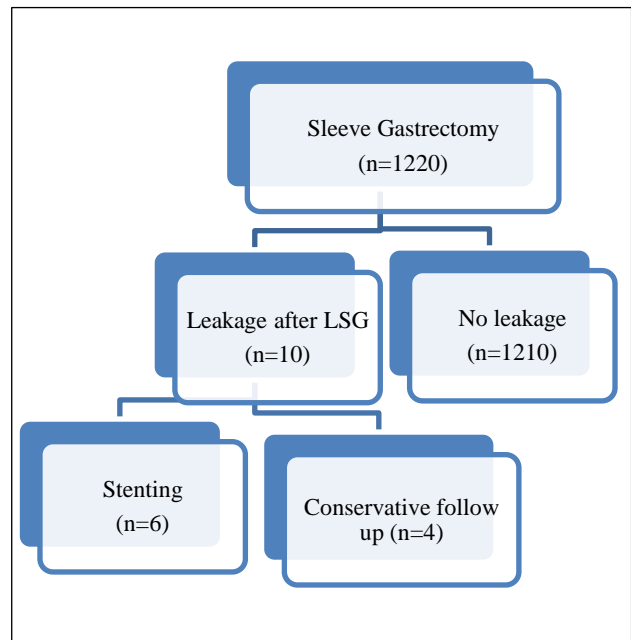


Figure 1: Incidence and management of leak after LSG.

Table 1: Demographic features and results.

Patients no:	Age	Sex	BMI (kg/m ²)	Leakage detection time	Stent removed time	Complication	Additional Intervention
1	37	M	41.32	28 day	7 weeks	None	A drainage catheter was inserted under radiology guidance.
2	43	F	44.08	90 day	6 weeks	None	None
3	58	F	44.11	23 day	5 weeks	None	None
4	26	F	46.42	9 day	8 weeks	None	A surgical drainage catheter was inserted
5	28	F	40.63	10 day	8 weeks	None	None
6	38	M	43	42 day	9 weeks	None	A drainage catheter was inserted under radiology guidance.

All of the cases detected to have leakage were admitted to the hospital. Appropriate antibiotic treatments were initiated. All the patients received total parenteral nutrition during the period when their oral intakes were closed. Gastrosopies revealed that leaks in all of the patients were at the gastroesophageal junction. Self-expandable, fully covered stent procedure was applied to all patients. Oral intake was initiated after the stent procedure. The cases whose clinical and laboratory levels were stable were discharged. Stents were removed in patients in whom no intraabdominal collection was detected in imaging, and hemogram and biochemistry values were normal. No complication due to stent was developed. Retrosternal pain and nausea occurred in some patients after application of stents. The symptoms were regressed after medical treatment.

DISCUSSION

Sleeve gastrectomy has been gaining popularity in morbid obesity surgery. Its most feared complication is a leak from the staple line. Knapp et al, determined the leakage rate as 3.5%.⁴ With increasing surgical experience these rates decrease further.

The main factor blamed from leakage is micro perforations after ischemia of the staple line. In literature, it was reported that suturing the staple line as a stabilizer may reduce leakage rates. Although results of fibrin tissue adhesives are controversial, the general opinion is that they have no effect on leaks.^{4,6-8} Cesana et al, evaluated 1738 patients, detected leaks in 45 (2.6%) patients and reported no association between leaks and preoperative variables.⁹ The operative variables which were detected to be associated with lower leak incidence included strengthening the staple line and the experience of surgeons. They reported that most of the leaks occurred in the first 100 cases of the surgeons which emphasized the importance of the learning curve. Shorter than a 2cm distance from pylorus was significantly associated with a high fistula incidence in univariate analysis.⁹ On the other hand, Parikh et al couldn't detect an association between the proximity to pylorus and leakage.¹⁰ In the same study, the leakage rate was lower when a bougie equal to or larger than 40F was used. The leakage rate after LSG changes between 0-5.5%.¹¹ The leakage rate in our study was 0.81%. Suture line strengthening was not performed to any patients. All of the operations were performed by the same surgeon. Casella et al, detected that the gastroesophageal junction was the most common location for leakage.³ All of the leakages in our study were also from the same location.

The leakages generally present with the complaints of tachycardia, abdominal pain, high fever, hypotension, and nausea. These complaints are associated with a high bleeding and leakage rate at the postoperative period.^{12,13} Early diagnosis and intervention are crucial in leak management. Intraabdominal abscess and fluid collection

forms detected by imaging methods may be treated with catheter drainage which is applied with laparoscopic guidance. Appropriate antibiotic treatment is also vital for these patients. Esophageal stent application may be beneficial for patients who don't respond to drainage and antibiotic therapy. Usually, fully covered stents that cover the leak area are preferred. By this way, exposure of saliva and food to leak area may be prevented. Esophageal stents are generally used for the management of dysphagia due to malignant masses, esophageal perforation, tracheoesophageal fistula, and leaks which develop after esophagogastric surgery.¹⁴ Esophageal stent may be applied with or without fluoroscopy. Fluoroscopy provides a big advantage for the correct positioning of the stent. However, fluoroscopy can't be applied every time. There are reports in the literature that stent insertion without fluoroscopy is safe and convenient.¹⁵ Stents were placed without fluoroscopy in our study. No complication occurred due to these procedures.

Leakages generally close in 6-8 weeks with fibrosis depending on the size of the leak. If the leak can't be controlled with all these minimally invasive methods, surgery should be prioritized. In general, primary repair in the surgical management of leaks after sleeve gastrectomy doesn't give a good result. More complicated procedures like gastric bypass are required.

Limitations of this study are its retrospective nature and the low number of patients. However, all surgical procedures were performed by the same surgeon. The same surgical technique and stapler type were used during surgery. The leakage rates are in parallel with the literature. We think this will contribute the literature by providing the number of operations by a single surgeon and the rate of leak.

CONCLUSION

In a conclusion, sleeve gastrectomy is used increasingly for obesity surgery. Therefore, surgeons frequently come across with complications of sleeve gastrectomy. Leakage is a complication which is the most frightening and the most difficult to manage. Stents can be safely applied by experienced endoscopists for the management of sleeve gastrectomy leakage.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Dogan F, Dincer M. Management of sleeve gastrectomy leakage with endoscopic stenting. *Int Surg J* 2019;6:824-7.