

# Endoscopic Septotomy as a Treatment for Chronic Leak after Laparoscopic Sleeve Gastrectomy

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Acute leakage after sleeve gastrectomy progresses into chronic leakage by 10-28.1%, which causes the surgeon to be disturbed. The main treatment for chronic leakage is surgery, but the authors report successful care with endoscopic septotomy. Forty-one year old female patient with a BMI of 42.8 (161.6 cm/111.8 kg) underwent a laparoscopic sleeve gastrectomy. The leakage of the proximal part of the staple resection line was verified in the abdominal CT on the fourth day after the procedure due to pain in the left shoulder that could not be clarified. After appropriate treatment including stent, the patient ended the acute leakage treatment 150 days after surgery. However, the patient was visited for 10 months after removed percutaneous catheter drainage due to fever and pain in the left shoulder. Afterwards, chronic leakage was confirmed from the CT and endoscopy at POD 15 months. We performed endoscopic treatment in the operating room under general anesthesia. At the gastroesophageal junction, we could find chronic leak orifice and bridging fold between stomach lumen and abscess pocket. Endoscopic septotomy was performed with the endoscopic knife and electro-surgical unit, until the stomach lumen and abscess pockets were fully in communication. After the patient was discharged without any complications and is currently under close observation. Endoscopic septotomy as a treatment for chronic leak is feasible and safe. Herein, we report this case with video clip.

**Key Words:** Sleeve gastrectomy, Acute leak, Complication, Septotomy, Endoscopy

## INTRODUCTION

Laparoscopic sleeve gastrectomy is now the most frequently performed primary obesity surgery [1]. Leak after laparoscopic sleeve gastrectomy is considered as a fatal complication and ranges from 1% to 2.9% [2,3]. Depending on the duration of the leak after surgery, acute if within 7 days; early within 1-6 weeks; late within 6-12 weeks; Expressed as chronic if > 12 weeks from surgery [3].

Surgical management should be considered as a treatment

option for chronic leak after laparoscopic sleeve gastrectomy, especially after failure of adequate endoscopic, radiologic and nutritional healing protocols [2]. However, surgical treatment tends to have a high complication rate, thus less invasive and effective endoscopic septotomy was first reported in stable patients by Baretta et al. [4]. After that, several studies for usefulness of endoscopic septotomy for the treatment of recurrent leaks has been reported [5-7].

The main treatment for chronic leakage is surgery, but the authors report successful care with endoscopic

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septotomy. As far as we know, this is the first case in Korea, and we report the case with a video.

## CASE PRESENTATION

Forty-one year old female patient with a BMI of 42.8 (161.6 cm/111.8 kg) underwent a laparoscopic sleeve gastrectomy. On the 4th day after the operation, pain in the left shoulder appeared that could not be explained, and the leakage of the proximal part of the staple resection line was checked in the abdominal CT. Percutaneous catheter drainage and endoscopic stent were treated (Fig. 1), and the stent was removed 6 weeks after insertion and percutaneous catheter drainage was removed 150 days after surgery.

The patient was visited for 10 months after removed percutaneous catheter drainage due to fever and pain in the left shoulder. Afterwards, chronic leakage was confirmed from the CT and endoscopy at POD 15 months. We treated endoscopic septotomy. We performed endoscopic treatment in the operating room under general anesthesia. We used a forward view endoscope with distal cap and intubated to esophagus in the standard method on supine position. At the gastroesophageal junction, we could find chronic leak orifice and bridging fold between stomach lumen and abscess pocket. During further examination with irrigation, inflammatory exudate was



Fig. 1. Abdominal X-ray after endoscopic stent insertion.

suctioned from abscess orifice. After deciding to perform a septotomy of bridging fold, we once again confirmed the surgically deformed stomach, and confirmed that there was no stenosis or obstruction in the stomach between corpus and antrum. Endoscopic septotomy of bridging fold to divide the stomach lumen and abscess was performed using a L-type Knife (Finemedix co. Daegu, Korea) connected to an electrosurgical unit (VIO<sup>®</sup>300D; ERBE, Tübingen, Germany). When the entire abscess communicated with the stomach lumen, the division of the diaphragm was considered complete. Hemostasis was performed with hot biopsy forceps (Radial Jaw 4; Boston Scientific co., Marlborough, MA, USA) on the exposed muscles around the septotomy line to prevent delayed bleeding (Supplementary Video 1). After the patient was discharged without any complications and is currently under close observation.

## DISCUSSION

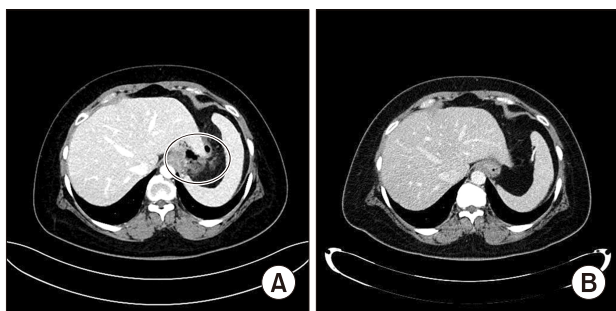
Many factors have been associated with increased risk of leak after laparoscopic sleeve gastrectomy [8]. A significantly higher leakage rate was correlated with male gender, higher BMI, concomitant sleep apnea, conversion to laparotomy, longer operation time, use of both buttresses and oversewing, and the prevalence of intraoperative complications. Most leaks could be treated by percutaneous drainage, stenting, and broad-spectrum antibiotic therapy. However, in the case of repeated chronic leaks, the treatment is unclear and technically demanding.

The therapeutic approach to leakage can be divided into acute phase and chronic phase depending on the timing. Treatment of the acute phase mainly includes conservative treatment including nutrition, drain, and antibiotics, and endoscopic stent insertion in patients who do not respond to conservative care. Endoscopic stents have been shown to be a successful treatment choice for acute or early leaks, with success rates ranging from 84–94% [9]. Mega stents have also been identified as a successful leak treatment tool, with the added benefit of being able to exclude the whole staple line [10]. However, in this case, Mega stents treatment was unsuccessful.

In the chronic phase, surgical treatment is mainly

performed. Revisional surgery with gastric bypass, fistulojejunostomy, proximal gastrectomy, or total gastrectomy with esophagojejunostomy can be needed if endoscopic modalities fail or chronic phase of leak patient [11]. The mechanism of the chronic leak is explained as follows. Intraluminal pressure of the stomach increases after laparoscopic sleeve gastrectomy [12] and can lead to a pressure gradient favoring flow through the fistula or leak into the abscess cavity, thus leading to a vicious cycle further preventing closure. Septum division allows for equalization of stomach and abscess cavity pressures, which, when combined with aggressive sleeve dilatation, allows flow to be transferred to the sleeve's distal section [13]. The therapeutic utility of endoscopic septotomy using this principle has been reported [4–7,13,14]. We decided to perform endoscopic septotomy before surgery in this case. However, since it was the first attempt, if endoscopic septotomy failed, it was planned to immediately switch to surgical treatment such as fistulojejunostomy. The endoscopic septotomy was successful and there were no problems with the patient's radiologic findings after treatment (Fig. 2). So, we suggest if a patient has elevated intraluminal pressure, a matured septum, and a well-contained abscess cavity, it is better to attempt endoscopic septotomy first, which has a non-invasive benefit, rather than performing surgery right away.

In conclusion, as a treatment for repeated leaks after sleeve gastrectomy, in the case of contained abscess with matured septum, endoscopic septotomy is considered to be useful method.



**Fig. 2.** Radiologic findings before (A) and after (B) endoscopic septotomy.

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## AUTHOR CONTRIBUTION

Study conception and design: Kyung Won Seo.

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Drafting of manuscript: Ki Hyun Kim, Kyoungwon Jung.

Critical revision: Kyoungwon Jung, Kyung Won Seo.

## SUPPLEMENTARY DATA

Supplementary data to this article can be found online at <https://youtu.be/IbxhigY94fE>

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