Incisional Therapy: Safe and Effective?

Jun Hyung Cho
Digestive Disease Center, Soonchunhyang University Hospital, Seoul, Korea

Introduction

Esophageal strictures are a common problem in gastroenterological practice. Common benign causes include peptic injury, Schatzki’s rings, radiation injury, caustic ingestions and anastomotic strictures. Dilation has been the customary treatment for benign esophageal strictures through the years. Although dilation usually results in symptomatic relief, stricture may recur after initial treatment in up to 30% to 40% of patients and require repetitive procedures. In small cases series, endoscopic incisional therapy has been used in patients with benign esophageal strictures. Recently, it is highlighted as alternative method in refractory or recurrent esophageal strictures.

Incisional therapy

1. Anastomotic stricture after GI surgery

Benign anastomotic stricture of the esophagus after surgical resection occurs in 5% to 46% of patients. Factors responsible for anastomotic stricture formation are postoperative complications, such as leakage, fistula formation and infection at the anastomosis, and ischemia of the upper part of the gastric tube. Usually, benign esophageal strictures are successfully managed by using endoscopic balloon dilation. The success rate varies from 78% to 100%. However, there is a significant recurrence rate that requires repeated dilation sessions to maintain patency. In several studies, endoscopic incisional method has been performed in patients with recurrent or refractory anastomotic strictures.

A total of 51 patients showed anastomotic stenosis after esophageal resection or total gastrectomy. Scar tissue was excised with polypectomy snare from the thickest part of the scar. By circular cutting, the stenosis was opened to a diameter 1.2-1.5 cm. Then, the gastroscope passage was possible and all patients were relieved from severe dysphagia. However, long-term outcomes were not described.

Endoscopic incision using sphincterotome was performed in 6 patients with anastomotic stenosis after gastrojejunostomy. Mean six radial incisions were made without immediate or delayed complication. No recurrence of stenosis was seen during mean 24-month follow-up (range 8-33 months).

Twenty patients had refractory anastomotic stricture to repeated Savary bougie dilation. Before treatment, the mean diameter of the anastomosis was 6 mm (range 3-9 mm). With the needle knife under direct vision (Endocut mode), radial incisions parallel to the longitude of the esophagus were made in the stenotic ring. During a follow-up of 1 year, 12 patients with a short segment stenosis (less than 1 cm in length) remained without dysphagia after a single treatment. In 8 patients with a long segment stenosis (1.5-5 cm), a mean of 3 treatments were required due to recurrence of dysphagia. In another study, endoscopic incision was also performed in nine patients. The median symptom-free interval between dilations was 13 days and median number of dilations was six (range 3-12) before incisional treatment. After treatment, 8 of 9 patients experienced a reduction in dysphagia symptoms and a decreased need for endoscopic dilations (follow-up: 90-420 days).
In a study, endoscopic incision was performed as primary treatment. A total of 24 patients underwent radial incisions by pulling up the Iso-Tome or insulated-tip (IT) knife with a pure-cutting current at a power output setting of 40 W/s. A mean of 9 radial incisional procedures (range 8-12) were successfully completed within 10 minutes. During 24 months of follow-up observations, 21 of 24 patients (87.5%) received only 1 dilation session and had no recurrent dysphagia. The remaining 3 patients (12.5%) developed recurrent stricture at a mean of 1.6 months. The occurrence of restructree was statistically more prevalent in long-segment stricture (>1 cm) (2/3 [66.7%]) than short-segment stricture (<1 cm) (1/21 [4.8%]) \( (P = 0.032) \).

In treatment of anastomotic stricture, a randomized comparison study of endoscopic incision (EI) with Savary bougienage (SB) was conducted. The result showed no significant difference between the EI (n = 31) and SB (n = 31) groups in the mean number of dilations (2.9 vs. 3.3, \( P = 0.46 \)) or the success rate (80.6% vs. 67.7%, \( P = 0.26 \)). Therefore, the effectiveness of endoscopic incision as a primary treatment remains controversial.

Recently, the radial incision and cutting (RIC) method was introduced as a new electrocautery treatment. In this method, radial incisions are performed with an IT knife, followed by cutting away of the fibrotic tissue between the incisions. In this retrospective study, 54 patients with refractory anastomotic stricture after esophagogastric surgery underwent RIC procedure. The median procedure time was 14 minutes and there were no serious complications. As a short-term effect, the dysphagia improved after RIC in 93.8% (n = 30/32) of patients. As a long-term effect, 63% (n = 17/27) and 62% (n = 13/21) of patients were able to eat solid food 6 and 12 months after RIC, respectively. In RIC group, the 6-month and 12-month patency rates were significantly higher, compared with those of continued balloon dilation group (65.3% vs. 19.8%, \( P < 0.005 \); 61.5% vs. 19.8%, \( P < 0.005 \)). However, the severity of the stricture was not well balanced between both groups, in terms of the size and length.

2. Peptic esophageal stricture

Incisional therapy performed in treatment of peptic esophageal stricture. In 20 patients, the minimum diameter of the stenotic ring was 4.4 ± 2.2 mm, increasing up to 10.05 ± 1.5 mm once the endoscopic incision was performed. Four patients experienced treatment failure and technical success rate was 80% (n = 16/20). Of these, 4 patients had good initial results, but symptoms recurred early and they were re-treated with a good result in two cases. During follow-up, recurrence increased for the first 6 months, and then leveled out.

3. Schatzki’s ring

Recurrent Schatzki’s rings after bougienage were treated successfully using endoscopic incision. After incision, there was significant improvement in median dysphagia score, compared with that before incision (6 vs. 0, \( P = 0.002 \)). Also, initial incision showed a significant increase in mean duration of improvement in dysphagia, compared with that after previous dilation alone (17 months vs. 5 months, \( P = 0.034 \)).

4. Esophageal caustic stenosis

In esophageal caustic stenosis, there was only a case report. In a patient with esophageal caustic stenosis (sodium hydroxide ingestion) was treated with incisional treatment. Although repeated balloon dilation and stent placement, there was no improvement at stricture site. Using needle knife, several small cuts (Endocut mode) parallel to the longitudinal axis of the esophagus were made, resulting in widening of the lumen and easy passage of the scope. There were no procedure-related complications. At the 1-year follow-up, only minor fibrotic retraction was seen and no further therapeutic intervention was required.
5. Esophageal stricture after chemoradiotherapy or endoscopic submucosal dissection

Recently, incisional therapy was performed in patients with refractory stricture related to esophageal cancer.\textsuperscript{11} They had experienced nonsurgical treatments of esophageal cancer, including chemoradiotherapy (CRT) alone (n = 3), CRT followed by salvage endoscopic treatment (n = 3), or endoscopic submucosal dissection (ESD; n = 2). After procedure, dysphagia in all patients dramatically improved to grade 1 or 0 without any major complications; however, the long-term efficacy was unfavorable as only 37.5\% (n = 3/8) demonstrated adequate lumen patency at 3 months, and re-intervention was necessary in 75\% (n = 6/8).

6. Combination therapy with other modality

Endoscopic incision was combined with balloon dilation.\textsuperscript{12} In 6 patients with anastomotic stricture, two or three small radial incisions were made with the endoscopic diathermic knife. Then, the incisions were split bluntly and the stenosis was dilated with balloon-dilator. In 5 of the 6 patients, both subjective and objective improvements were noted for more than 4 weeks.

A study reported the result of incisional therapy in combination with argon plasma coagulation (APC).\textsuperscript{13} A total of 15 patients suffered from benign anastomotic stricture after upper gastrointestinal surgery. Initially, eccentric stricture was excised several times with a polypectomy snare. The scar tissue between the radial incisions was then reduced step by step using APC. In all patients, a sufficient reopening of the stenotic anastomosis was obtained. The endoscope passed easily through the stenosis after treatment.

Endoscopic microwave treatment

Microwave energy produces heat dielectrically based on molecular motion produced by ultrahigh frequency excitation. Microtaze (Heiwa Electronic Industry, Japan) produces microwave with oscillating frequency of 2,450 MHz, wavelength of 12 cm, and maximum output of 100 Watts. The high frequency is transmitted to a monopolar type surgical electrode through a coaxial cable. After contacting the ball or needle type electrode into the tissue, the microwave is oscillated. In previous studies, microwave system was used in various endoscopic treatments, such as anastomotic stricture, ulcer bleeding, ablation of malignant lesions.\textsuperscript{14-16}

Conclusions

In patients with anastomotic esophageal strictures, incisional therapy may be considered as a second-line treatment. Especially, recurrence rate is lower in short segment stricture. Incisional therapy can be combined with other modality, such as balloon dilation. In the future, large scaled trials are needed to confirm the efficacy of this technique in management of benign esophageal stricture.

References