Treatment of esophageal stricture is important because esophageal stricture reduces the quality of life of patients by increasing their risks of dysphagia, weight loss, nutritional imbalance, and pneumonia due to aspiration.

Esophageal stricture is mainly classified as benign or malignant esophageal stricture, and may occur as fibrous proliferation and collagen deposition due to chronic ulceration or chronic inflammation or as complications after chemotherapy, radiotherapy, and surgery such as esophagectomy, or endoscopic procedures such as endoscopic mucosal resection and endoscopic submucosal dissection for the treatment of esophageal cancer.1,2 Esophageal stricture caused by active peptic ulcer or gastroesophageal reflux can be treated with drugs such as proton pump inhibitors, which inhibit gastric acid secretion. However, esophageal dilation has been used as the first-choice treatment modality for esophageal stricture without acute inflammatory response.

Esophageal dilation generally involves esophageal bougination, balloon dilation, and stent insertion.3 Among these, endoscopic balloon dilation using a through-the-scope balloon is widely used as an important treatment approach for esophageal stricture owing to its lower complication rates than other methods.4 Endoscopic balloon dilation can be operated under direct endoscopy, and the risk of perforation is lower than that with esophageal bougination because the force is not applied to the longitudinal axis of the stricture zone and the radial pressure is applied completely.5 Moreover, the possibility of pressure or damage to the pharynx and larynx is also relatively low.6 However, in the case of malignant esophageal stricture, esophageal bougination or balloon dilation can provide a short-term symptom improvement and is usually used as an auxiliary procedure prior to stenting or photodynamic therapy.7

In this issue of Clinical Endoscopy, Goyal et al. retrospectively analyzed the health-care utilization of endoscopic dilation for the treatment of esophageal strictures in the inpatient setting, and defined the rate of complications and outcomes of this procedure by using data from the National Inpatient Sample (NIS) database.7 They analyzed 591,187 hospitalizations involving esophageal stricture that occurred between 2007 and 2013, and endoscopic dilation was performed in 29% of esophageal stricture cases. Compared with the benign stricture group, the malignant stricture group had more frequent utilization, longer hospital stays, higher in-hospital mortality rate, and higher incidence of esophageal perforation. Although they already mentioned some limitations in the Discussion section, they presented evidence-based conclusions by analyzing data from the NIS database.

In a previous large-scale study, the major complications re-
lated to esophageal dilation were perforation (0.1%–0.4%) and bleeding (0.3%), similar to those in this study. Other studies reported high incidence of esophageal-related complications as follows: First, in the case of stricture caused by malignant diseases such as esophageal cancer, the perforation rate related to dilation therapy was high. Second, in the benign diseases, the stricture caused by radiotherapy and surgery were related to the risk of perforation.

Various methods have been reported to reduce the complications of esophageal perforation and to increase the success rate of esophageal dilation. Several studies have reported that esophageal dilation does not attempt to expand balloons more than 3 mm at a time, or if the resistance is felt in bougienation, the risk of perforation is reduced by not sequentially expanding more than three times. Another study reported that local injection of steroid after balloon dilation would be effective because it suppresses local inflammatory reactions and inhibits collagen formation. A method of incision of the stricture site by using an argon plasma coagulation method or an endoscopic incisional knife has been proposed for the purpose of sufficiently expanding the lumen of the esophagus by separating the fibrotic tissue and restraining the regeneration of fibrotic tissue. Although methods for introducing self-expanding stents in refractory benign esophageal strictures have been reported, the stent has to be removed 4 to 12 weeks after stenting, and the success rate of esophageal stenting after stenting is approximately 24%.

In conclusion, endoscopic esophageal dilation is a useful treatment for patients with esophageal stricture, although complications such as esophageal perforation are more common in patients with malignant strictures. Therefore, the timing of endoscopic esophageal dilation in patients with esophageal stricture should be determined. Moreover, considering the advantages and disadvantages of various endoscopic esophageal dilation procedures, the appropriate method of endoscopic esophageal dilation should be chosen in accordance with the cause and condition of the stricture.

**Conflicts of Interest**

The author has no financial conflicts of interest.

**REFERENCES**

1. Honkoop P, Siersma PD, Tilanus HW, Stassen LP, Hop WC, van Blankenstein M. Benign anastomotic strictures after transhiatal esophagectomy and cervical esophagogastronomy: risk factors and management. J Thorac Cardiovasc Surg 1996;111:1141-1146; discussion 1147-1148.
2. Pierie JP, de Graaf PW, Poen H, van der Tweel I, Obertop H. Incidence and management of benign anastomotic stricture after cervical oesophaagostomy. Br J Surg 1993;80:471-474.
3. Spechler SJ. AGA technical review on treatment of patients with dysphagia caused by benign disorders of the distal esophagus. Gastroenterology 1999;117:233-254.
4. Scolapio JS, Pasha TM, Gostout CJ, et al. A randomized prospective study comparing rigid to balloon dilators for benign esophageal strictures and rings. Gastrointest Endosc 1999;50:13-17.
5. Jones DB, Davies PS, Smith PM. Endoscopic insertion of palliative oesophageal tubes in oesophagogastric neoplasms. Br J Surg 1981;68:197-198.
6. Anderson PE, Cook A, Amery AH. A review of the practice of fiberoptic endoscopic dilatation of oesophageal stricture. Ann R Coll Surg Engl 1989;71:124-127.
7. Goyal A, Chatterjee K, Yadlapati S, Singh S. Health-care utilization and complications of endoscopic esophageal dilation in a national population. Clin Endosc 2017;50:366-371.
8. Standards of Practice Committee, Egan JV, Baron TH, et al. Esophageal dilation. Gastrointest Endosc 2006;63:755-760.
9. Lew RJ, Kochman ML. A review of endoscopic methods of esophageal dilation. J Clin Gastroenterol 2002;35:171-176.
10. Ramage JJ Jr, Rumalla A, Baron TH, et al. A prospective, randomized, double-blind, placebo-controlled trial of endoscopic steroid injection therapy for recalcitrant esophageal peptic strictures. Am J Gastroenterol 2005;100:2419-2425.
11. Samanta J, Dhaka N, Sinha SK, Kochhar R. Endoscopic incisional therapy for benign esophageal strictures: technique and results. World J Gastrointest Endosc 2015;7:1318-1326.
12. van Halsema EE, van Hoof JE. Clinical outcomes of self-expandable stent placement for benign esophageal diseases: a pooled analysis of the literature. World J Gastrointest Endosc 2015;7:135-153.
13. Thomas T, Abrams KR, Subramanian V, Mannath J, Ragunath K. Esophageal stents for benign refractory strictures: a meta-analysis. Endoscopy 2011;43:386-393.