



Pneumatic dilation for achalasia: new techniques to improve an old procedure

Olumide O. Ajayeoba, MD, MBA, FACP, David L. Diehl, MD, FASGE, FACP

Pneumatic dilation (PD) remains an important treatment for achalasia (Fig. 1). PD has similar effectiveness compared with surgery (Heller’s myotomy) and is a very cost-effective treatment option. PD causes circumferential stretching of the lower esophageal sphincter (LES) with subsequent controlled tearing of its muscle fibers. PD is done under fluoroscopic guidance by inflating a noncompliant polyethylene balloon at the level of the LES. The goal of treatment is symptomatic relief characterized by a postdilation reduction of the Eckardt symptom score to 3 or less.¹ The efficacy of PD ranges from 71% to 90%.^{2,3} Predictors of good response include older age, female sex, type 2 achalasia, narrow esophageal caliber, and LES pressure less than 10 mm Hg postdilation.¹

INDICATION AND CONTRAINDICATIONS

PD is indicated in type 1, 2, and 3 achalasia. Contraindications include severe coagulopathy or poor cardiopulmonary status precluding endoscopy.

PROCEDURAL CHALLENGES

A major technical challenge is accurately locating the LES under fluoroscopy. Inaccurate localization leads to misplacement of the balloon, decreasing the effectiveness of the dilation.² Inaccurate location can be caused by diaphragmatic movement during respiration or slippage of the balloon during inflation.⁴ Other challenges include performing a high-quality postdilation inspection and efficiently ruling out a perforation after dilation. Simple techniques to mitigate these problems are described in the following.

EQUIPMENT

Equipment required includes a gastroscope with auxiliary water jet, clear distal attachment, achalasia balloon with inflator, guidewire, injection needle, and contrast medium. PD balloons are available in 30-, 35-, and 40-mm sizes, with fluoroscopic markers to facilitate centering the balloon at the LES. There is a higher risk of perforation with use of larger balloons for initial dilation.⁵

PROCEDURE

Endotracheal intubation is often done to prevent aspiration. Food in the esophagus should be removed before PD.

The tight LES near the top of the gastric folds is identified, and 1 to 2 mL of contrast is injected into the submucosa at a convenient spot (Video 1, available online at www.VideoGIE.org). Fluoroscopically, the tattoo appears as a radiopaque spot above the gastric air bubble.

A guidewire is passed into the antrum, and the endoscope is withdrawn until the wire is caught outside the patient’s mouth. Suctioning air from the stomach facilitates fluoroscopic assessment of balloon inflation. The deflated balloon catheter is inserted over the guidewire and attached to the inflator.

Fluoroscopically, the balloon is positioned below the tattoo and then pulled back until the middle of the balloon is centered at the tattoo. The balloon is slowly inflated until a “waist” is seen forming at the LES. During inflation,

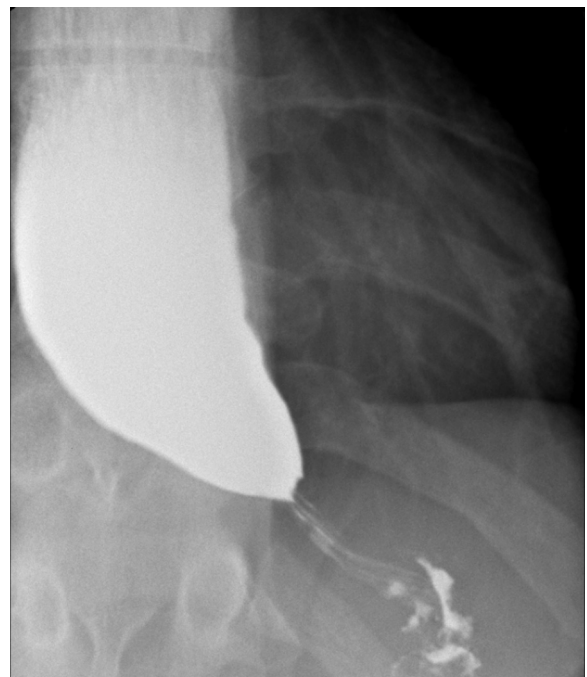


Figure 1. Achalasia demonstrating incomplete relaxation of lower esophageal sphincter and dilated aperistaltic esophagus (“bird beak” appearance). Image courtesy of O. Ajayeoba.

maintaining back tension on the catheter is important to avoid balloon slippage into the stomach.

Once the balloon waist is fully effaced, pressure is maintained for 60 seconds, and then the balloon and guidewire are removed.

POSTDILATION INSPECTION

A high-quality inspection after PD is important to rule out a perforation and is facilitated with use of a distal attachment. Superficial esophageal mucosal tears, sometimes impressively wide, are expected. Bleeding after PD is common and can be impressive, but it typically stops spontaneously. Perforation is suggested by a breach in the muscular layer. There have been no perforations in our experience with this technique.

If there is concern for perforation, an intraprocedural contrast (gastrograffin) study can be done immediately. Contrast is injected into the esophagus and monitored fluoroscopically. Any extravasation of contrast confirms a perforation.

ADVERSE EVENTS

Adverse events include perforation, intramural hematoma, chest pain, and late-onset reflux.

CONCLUSION

PD is a safe and effective treatment for achalasia but can have technical challenges. Fluoroscopic tattooing can improve balloon placement. Careful cap-assisted inspection after dilation can exclude or suggest perforation. An immediate contrast study can be done; if a perforation is

identified, endoscopic closure can be undertaken immediately.

DISCLOSURE

Dr Diehl is a consultant for Boston Scientific and Cook Endoscopy. All other authors disclose no financial relationships.

Abbreviations: LES, lower esophageal sphincter; PD, pneumatic dilation.

REFERENCES

1. Schlottmann F, Patti M. Esophageal achalasia: current diagnosis and treatment. *Exp Rev Gastroenterol Hepatol* 2018;12:711-21.
2. Vaezi MF, Pandolfino JE, Vela MF. ACG clinical guideline: diagnosis and management of achalasia. *Am J Gastroenterol* 2013;108:1238.
3. Ghoshal UC, Kumar S, Saraswat VA, et al. Long-term follow-up after pneumatic dilation for achalasia cardia: factors associated with treatment failure and recurrence. *Am J Gastroenterol* 2004;99:2304-10.
4. Sabharwal T, Cowling M, Dussek J, et al. Balloon dilation for achalasia of the cardia: experience in 76 patients. *Radiology* 2002;224:719-24.
5. Boeckxstaens GE, Annese V, des Varannes SB, et al. Pneumatic dilation versus laparoscopic heller's myotomy for idiopathic achalasia. *N Engl J Med* 2011;364:1807-16.

Department of Gastroenterology, Geisinger Medical Center, Danville, Pennsylvania.

Copyright © 2020 American Society for Gastrointestinal Endoscopy. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.vgie.2020.05.011>
