

EXPERT'S CORNER

Pneumatic Dilation for Achalasia

TO THE EDITOR: I consider pneumatic dilation to be an outpatient procedure unless there is a procedural complication where the patient needs to be admitted to the hospital for observation or for a surgical procedure. All dilations are performed under fluoroscopic guidance in the endoscopic or radiologic suite.

I perform the dilation in the left lateral position because I find that in this position it is easier to advance the dilator without initiating severe gagging. Endoscopy is begun after significantly sedating the patient to minimize movement and pain during the dilation. Procedural amnesia is important as some patients may need to return for another dilation. If large particles of food are present following intubation, the endoscope is withdrawn and the esophagus irrigated with a large bore tube (Edlich tube or Code Blue Easi-Lav, Ballard Medical Products, Draper, Utah) with the patient in reverse Trendelenberg. A very tortuous esophago gastric junction (EGJ) requiring a sharp left turn, followed by a superior then downward maneuver to enter the stomach indicates to me that a stiff guide wire (Savory or Amplatz Super Stiff, 260 cm, Boston Scientific, Natick, Massachusetts) needs to be used to allow for the easy passage of the dilator across the EGJ. If only a soft, pliable wire is available, I will curl an extra length of wire in the stomach prior to removing the endoscope. Complete endoscopy is performed while inspecting for a hiatal hernia (which I think has a greater propensity for perforation), masses, nodularity, or friability, especially in the retroflexed position to rule out cancer. The wire is deployed in the antrum and as the endoscope is removed, I will continually suction air from the stomach and esophagus, as residual air will obscure the fluoroscopic image of the pneumatic bag during inflation. Following the deployment of the guide wire with fluoroscopy insures that the guide wire is relatively straight in the esophagus.

DILATION TECHNIQUE

I use Microvasive achalasia balloons (sizes 3.0, 3.5, and 4.0 cm diameter, Boston Scientific Corp.) (Fig. 1) and I always begin with the smallest 3.0 cm balloon diameter size with one dilation being performed per session (1). If the patient is not clinically better after 4–6 wk, I will move to the next size dilator (3.5 cm) and repeat the same regimen. The largest size dilator (4.0 cm) is employed if the patient does not respond to this dilation and undergoes surgery if dysphagia persists.

Since I consider pneumatic dilations to be a 2-person procedure, I attach extension tubing (4-way stopcock, 83.8 cm,

Medxmedical, Dublin, OH) to the balloon and to the sphygmomanometer port, which allows for greater freedom of movement for the individual inflating the balloon. A 60-cc lure-lock syringe (B-D, #309653) is placed on the 4-way stopcock of the extension tubing to deflate the bag prior to insertion and before retrieval of the dilator as a partially deflated 3.5 or 4.0 cm dilator may be difficult to retrieve through the distal esophagus and cricopharynx. The dilator size is confirmed prior to the dilation in addition to checking the bag for leaks and determining if the sphygmomanometer is functioning.

Fluoroscopy is then performed so that an image of the spine and the dome of the diaphragms are noted. In this position, the EGJ is located slightly anterior to the spine, 3–4 cm below the domes of the diaphragm. After lightly coating the dilator and the guide wire with lubricant, the dilator is advanced over the guide wire with the head tilted slightly backward, which straightens the posterior pharynx allowing for a smoother intubation into the esophagus. Fluoroscopy should be performed at about the midesophagus unless intubation difficulty is encountered more proximally. If the esophagus is not severely dilated, there should be little problem in passing through the EGJ. With a sigmoid esophagus, the tip of the dilator may turn superiorly at the EGJ. This problem usually occurs with a pliable guidewire and requires that the guidewire be pulled back gently while the dilator is advanced. This maneuver straightens the wire and allows for easier passage. Once the midportion of the dilator has advanced 3–4 cm below the dome of the diaphragm, the bag is slowly inflated under fluoroscopic visualization while carefully observing the indentation around the bag caused by the high pressure zone of the EGJ. If the indentation is not centered on the bag, I deflate and move the dilator to centrally position the EGJ on the bag. This may require 1–4 deflations while moving the dilator up or down before attaining this position. Centering the EGJ on the bag is probably the most important aspects of the pneumatic dilation as the entire EGJ, which includes the lower esophageal sphincter (LES) whose length ranges from 2 to 4 cm, must be dilated to result in an effective dilation. I will then gradually inflate the balloon under fluoroscopic guidance until the indentation disappears (7–10 psi). This pressure is maintained for 60 s (Fig. 2). Most patients will experience some discomfort during the dilation. In some cases, when inflating 3.5 and 4.0 cm diameter dilators, the bag will forcefully migrate toward the stomach. To counteract this movement and to keep the EGJ centered on the dilator, one must maintain a constant upward force during the entire dilation. After deflating the bag, I will reinflate the dilator to determine how much pressure is required to obliterate the waist defect, which is usually <3 psi. Using the syringe and the 4-way stopcock, I will aspirate the air from the bag and then withdraw the entire apparatus.

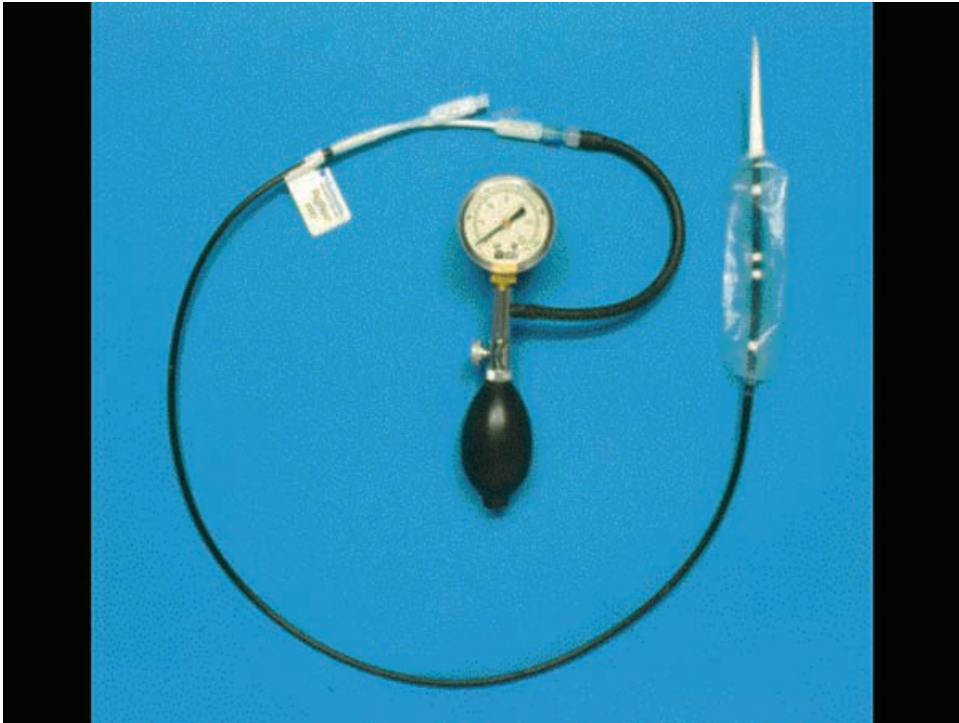


Figure 1. Microvasive dilator with the balloon inflated.

POST-DILATION STUDIES

Following the dilation, radiologic studies are performed to rule out esophageal perforation so that the patient must be awake enough to drink fluids without aspirating. Fluoroscopy is performed with the patient standing at 45 degrees. Initially the patient is administered 30 cc of gastrograffin. I always

have the patient hold the cup and drink the contrast as this maneuver allows the patient to coordinate hand-mouth movements with the act of swallowing decreasing the likelihood of aspiration. AP and lateral views of the EGJ are noted and if no perforation is noted, 90 cc of barium is administered. This amount of barium will place enough hydrostatic force on a small perforation so that it is unlikely to be missed. If no perforation is noted, the patient is recovered and allowed to go home the same day. Previous studies by our group have indicated that the amount of blood on the dilator, the degree of esophageal emptying immediately post-dilation, and the amount of pain experienced at the time of dilation are not prognostic indicators of success (2). For the rare patient with post-dilation pain, I will administer sublingual nitroglycerine or nifedipine.

POST-DILATION FOLLOW-UP

I will usually speak with the patients or have them return in 6 wk. If persistent dysphagia is noted, I will repeat the dilation with the next largest size dilator. Yearly follow-up is suggested at which point a quantitative barium-swallowing study is performed (3). Those individuals with persistent dysphagia, weight loss, and worsened emptying studies will either undergo another dilation or surgery. Quantitative barium studies as performed by Vaezi *et al.* (3) have the advantage over cornflake esophageal emptying studies as it compares the patient to him- or herself and allows the patient to drink barium until full. The advantage of this study is that it normalizes esophageal emptying to each individual patient as some patients have very dilated esophagi and require more barium

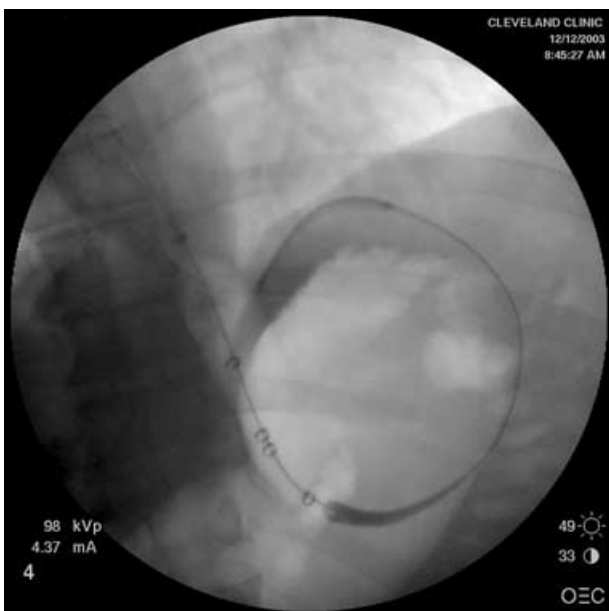


Figure 2. Fluoroscopic view of pneumatic dilation. The balloon is fully inflated and straddles the diaphragm.

to achieve the same hydrostatic column *versus* an individual with a relatively normal diameter esophagus.

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