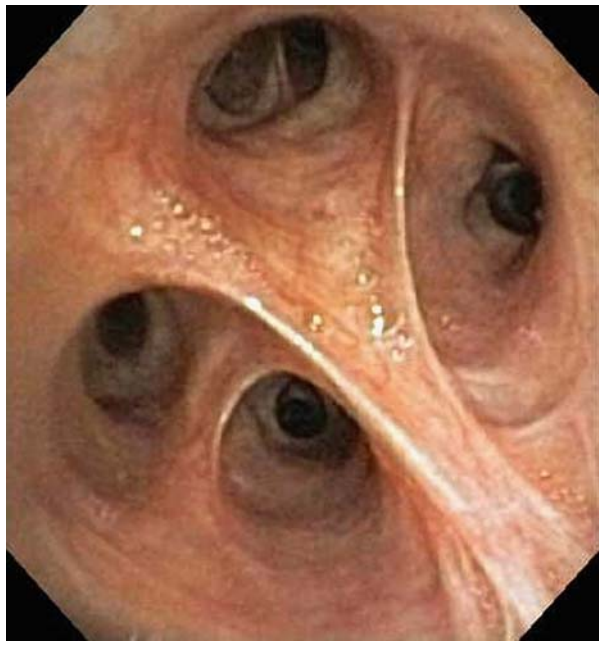

FIGURE 3. Right upper lobe close view with axillary segment.

Airspace disease in the axillary subsegment has a characteristic appearance on radiologic studies. Awareness of this variant anatomy may explain an otherwise confusing finding, and can help in obtaining samples. These images were obtained from surveillance bronchoscopies and depict the presence of the axillary segment (Figs. 1–3).

Diego I. Conci, MD
Cleveland Clinic Foundation
Beachwood, OH

REFERENCES

1. Boyden EA, Scannell JG. An analysis of variations in the bronchovascular pattern of the right upper lobe of fifty lungs. *Am J Anat*. 1948;82:27–64.
2. Atwell SW. Major anomalies of the tracheobronchial tree with a list of the minor anomalies. *Dis Chest*. 1967;52:611–615.
3. Foster-Carter AF. The anatomy ofthe bronchial tree. *Br J Tuberc*. 1942;36:19–38.
4. Yamashita H. *Roentgenologic Anatomy of the Lungs*. Tokyo: Igaku-Shoin Ltd; 1978:70–72.
5. Scanneil JG, Boyden EA. A study of variations of the bronchopulmonary segments of the right upper lobe. *J Thorac Surg*. 1948; 17:232–237.
6. Brock RC. *The Anatomy of the Bronchial Tree*. London: Oxford University Press; 1946:37–65.

Guidewire-assisted Technique for Placement of Endobronchial Watanabe Spigots

To the Editor:

Endobronchial Watanabe Spigots (EWS) are solid silicone blockers of varying diameters (5 to 7 mm), designed for their insertion by a flexible bronchoscope (FB). Indications include bronchial occlusion for management of persistent air leaks,[1] temporary control of hemoptysis,[2] and endoscopic lung volume reduction.[3] The traditional insertion technique consists of grasping the spigot with a flexible forceps that has been previously inserted within the working channel of the FB. As a unit, the bronchoscope with the flexible forceps/spigot is then advanced within the endobronchial lumen and directed toward the target bronchus, wherein it is implanted and released.

Technical difficulties posed by bronchi located at an acute angle can be solved by grasping and placing the EWS in a horizontal position. Introducing EWS effectively, into certain difficult locations (ie, upper lobe bronchi), requires skill and the procedure could be time consuming. Improper placement can lead to EWS migration and unsatisfactory results.

We describe a guidewire-assisted technique as an effective alternative to the "grasping technique" for the successful placement of EWS in the challenging locations. Under total intravenous anesthesia an airway is secured with an endotracheal tube. A systematic approach of sustained endobronchial balloon occlusions, using an endobronchial blocker, starts with the suspected lobar, segmental, and subsegmental bronchi to identify the air leak. The reduction of an air leak in the water seal system during 1 minute of ventilation identifies and confirms the target airway. Radial 360-degree EBUS 20 MHz balloon probe is then applied to aid in sizing the airway for selecting the EWS of an appropriate size. In efforts to decrease the likelihood of migration, we prefer to upsize the EWS in relation to the measured airway diameter. A 0.025 mm guidewire is inserted into the working channel of a flexible bronchoscope. The guidewire is

Disclosure: There is no conflict of interest or other disclosures.

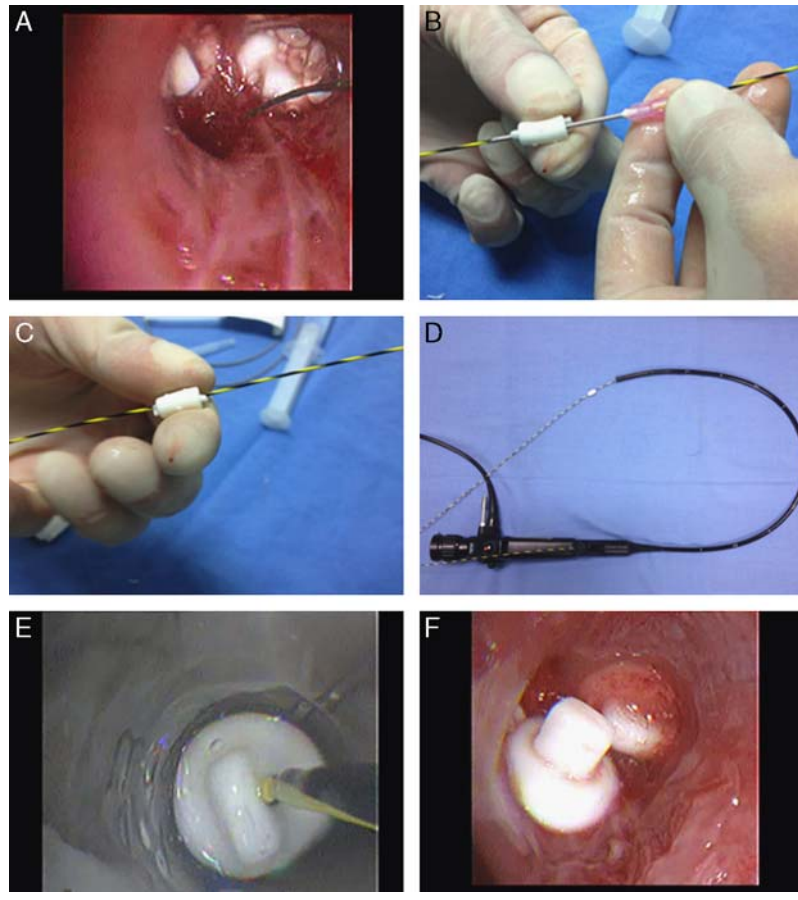

FIGURE 1. Bronchoscopic technique for Endobronchial Watanabe Spigots placement using a guidewire. The guidewire is advanced distally inside the target bronchus (A); after removing the bronchoscope and leaving the guidewire in place, the 18 G needle piercing the spigot is advanced over the proximal end of the guidewire (B); the needle is removed while holding the spigot over the guidewire (C); the proximal end of the guidewire is grasped with a forceps and pulled into the working channel (D); the tip of the bronchoscope is used to push the spigot, following the guidewire's path until it plugs the target bronchus and the guidewire can be removed (E and F).

gently advanced and introduced into the identified target bronchus and beyond into the periphery of the lung (Fig. 1A). The bronchoscope is then withdrawn completely after securing the guidewire in place. The selected EWS is pierced and traversed along its long axis with an 18 G needle. This 18 G needle/EWS unit is then loaded using the needle's hub onto the guidewire with the EWS in the forward position (Fig. 1B). The needle is now removed leaving the EWS traversed longitudinally by the guidewire alone (Fig. 1C). The proximal end of the guidewire is grasped by the forceps, loaded within the bronchoscope, and pulled back into its working channel until it exits at the proximal end of the working channel of the bronchoscope. The flexible bronchoscope is then reintroduced over the guidewire into the endotracheal tube and used to gently push the EWS toward the selected bronchus until satisfactory position is attained. (Figs. 1D–E). By gently wedging of the bronchoscope's tip within the target bronchus, the EWS is held in place while the guidewire is slowly removed (Fig. 1F).

The position and the angle of the target bronchus in relation to the bronchoscope's axis at the time of EWS placement may impact the migration rate. In a series by Sasada et al,[1] 3 of 4 cases of EWS migration occurred when spigots were dislodged from the often angulated B6 bronchus. The guidewire-assisted technique described here allows pushing the EWS more firmly and securely, the maneuver could prove useful under such circumstances. Another advantage of our technique is that it conserves the bronchoscope's optimal functional flexibility, which is lost while using a loaded forceps with the grasping technique.

Adequate airway visualization could be difficult during bronchoscopic management of hemoptysis.[2] Although we are yet to apply the guidewire-assisted technique for this indication, it could potentially facilitate guidance of EWS to control bleeding, a known limitation of the grasping technique in which both suction and visualization are compromised with working channel harboring the forceps. Bylicki and colleagues encountered anatomic difficulties in placing EWS for hemoptysis in 2 patients, both bleeding from upper lobe apical segments. They also suggested modifications for easier placement of the EWS in such cases.[4]

In our experience, spigots were not damaged during piercing with the needle; however, careful insertion is advised to avoid puncturing fingers with the needles. Lubrication of the guidewire with water-soluble gel allows easier loading and sliding of the EWS. It is advisable to remove the ruber cover at the tip of the guidewire before its placement, since it could later detach when pulled back and be retained inside the occluded bronchus. We also recommend starting with the most difficult target bronchus, if >1 EWS are being placed, as compression from the adjacent bronchial plug could augment the technical difficulty in placing additional EWS in the difficult locations.

The guidewire technique was first reported in the Japanese literature by Miyazawa et al,[5] who successfully placed 123 spigots in 26 patients. With the exception of using fluoroscopic guidance, their technique description (push & slide method), seems to be very similar to the one we describe. Almost 11% of the spigots in their series migrated. Although placement techniques were different, Sasada et al[1] reported that 17% of the 24 treated patients had migration of spigots placed with the grasping technique.

In summary, our technique for implanting EWS by guidewire assistance is a feasible alternative to the grasping technique avoiding radiation exposure and additional costs while facilitating their successful implantation in more challenging location. In the future, it would be worth considering manufacturing EWS with the guidewire channel.

Jose R. Rojas-Solano, MD*
Ismael A. Matus, MD, FCCP†
Luis Ugalde-Gamboa, MD*
Pulmonary Interventional Unit
Pulmonology Department, Hospital
Mexico, Costa Rica
†Division of Pulmonary, Critical Care and
Sleep Medicine, Georgetown University
Hospital. Washington D.C.

REFERENCES

1. Sasada S, Tamura K, Chang YS, et al. Clinical evaluation of endoscopic bronchial occlusion with silicone spigots for the management of persistent pulmonary air leaks. *Intern Med*. 2011;50:1169–1173.
2. Sakr L, Dutau H. Massive hemoptysis: an update on the role of bronchoscopy in diagnosis and management. *Respiration*. 2010;80: 38–58.
3. Maxfield R. New and emerging minimally invasive techniques for lung volume reduction. *Chest*. 2004; 125:777–783.
4. Bylicki O, Vandemoortele T, Laroumagne S, et al. Temporary endobronchial embolization with silicone spigots for moderate hemoptysis: a retrospective study. *Respiration*. 2012;84:225–230.
5. Miyazawa H, Shinno H, Noto H, et al. Bronchial occlusion using EWS (Endoscopic Watanabe Spigot) by push & slide method and a pilot study of bronchoscopic lung volume reduction using EWS for severe emphysema. *J Japan Soc Bronch*. 2003;25:695–703.