properties and sterile packaging to configure temporary sternotomy dressings when wounds are left open after surgical intervention, although no reference for this use is found.

Severe coagulopathy is common after biventricular assist device placement and is especially malignant after cardiopulmonary bypass with heparin alternatives. We have previously used several methods to arrest hemorrhage from ventricular assist device connections and grafts in the face of such coagulopathy and platelet dysfunction. One method is to apply strips of Penrose rubber drains with circumferentially tied silk sutures as compression bandages for a tamponade effect. Our experience is that this provides hemostasis, particularly at sites of connection between the metal ventricular assist device outflow and graft material. For bleeding graft interstices, we have had success with longitudinally splitting a second graft one size larger, sealing it with surgical adhesive, and applying this on top of the bleeding graft.

Neither technique worked in this case. Because Esmark is available in our operating room, it seemed a natural

extension to apply its consistent compression qualities in the form of an elastoplastic dressing for a bleeding outflow graft in the face of severe coagulopathy. In this configuration it seemed to provide effective and consistent pressure and can be considered for compression in situations other than extremity surgery.

We would like to acknowledge Rene Dekkers from Brigham and Woman's Hospital perfusion services for his inspiration over the years.

References

1. Latex-Free Esmark Bandages Web site. Available at: <http://www.fullflex.com/industries-served/medical-and-healthcare/esmark/default.html>.
2. Miles RH, Kollpaintner RE, Riveron FA, Johnkoski JA. The pneumatic tourniquet technique for endoscopic radial artery harvest. *J Card Surg.* 2004;19:495-8.
3. Grebing BR, Coughlin MJ. Evaluation of the Esmark bandage as a tourniquet for forefoot surgery. *Foot Ankle Int.* 2004;25:397-405.
4. Tarver HA, Oliver SK, Ramming GJ, Englemann B. Techniques to maintain a bloodless field in lower extremity surgery. *Orthop Nurs.* 2000;19:65-73.
5. Anonymous. Excessive cornstarch powder on latex (Esmark) bandages. *Health Devices.* 1996;25:150.

Bronchoscopic transesophageal ultrasound-guided needle aspiration: An alternative to the conventional transesophageal ultrasound-guided needle aspiration technique

Masahide Oki, MD,^a Hideo Saka, MD,^a Chiyoe Kitagawa, MD,^a and Shinji Sato, MD,^b Nagoya and Handa, Japan

The real-time ultrasound-guided needle aspiration technique through the airway (endobronchial ultrasound-guided transbronchial needle aspiration [EBUS-TBNA]) or esophagus (endoscopic ultrasound-guided fine needle aspiration [EUS-FNA]) has been reported to be an accurate and minimally invasive technique for evaluation of hilar/mediastinal lesions.¹⁻³ Both techniques have been reported to be complementary because some accessible regions differ from each other.¹⁻³ However, the combination of these procedures, which require separate equipment or examiners, is much more complex than either procedure by itself.

The mechanism of EBUS bronchoscopes is similar to that of EUS endoscopes, and therefore bronchoscopic transesophageal ultrasound-guided fine-needle aspiration might be feasible.⁴ We herein describe a patient with a mediastinal lymph node metastasis who did not undergo EBUS-TBNA but whose condition was successfully diagnosed by means of EUS-FNA with an EBUS bronchoscope.

CLINICAL SUMMARY

A 66-year-old man with a mediastinal abnormality on positron emission tomographic scanning was referred to our hospital for bronchoscopic evaluation. He had undergone right middle lobectomy because of lung cancer (adenocarcinoma) 7 years before and left upper segmentectomy because of lung cancer (adenocarcinoma) 2 years earlier. A follow-up computed tomographic scan showed a small lymph node in the left paratracheal mediastinal region (Figure 1, A), and subsequent fluorodeoxyglucose positron emission tomographic scanning revealed a hypermetabolic lesion (Figure 1, B).

Bronchoscopy was performed after achievement of local anesthesia and conscious sedation. The endobronchial

From the Department of Respiratory Medicine,^a Nagoya Medical Center, Nagoya and the Department of Respiratory Medicine,^b Handa City Hospital, Handa, Japan.

Disclosures: None.

Received for publication Sept 5, 2009; accepted for publication Sept 28, 2009; available ahead of print Nov 30, 2009.

Address for reprints: Masahide Oki, MD, Department of Respiratory Medicine, Nagoya Medical Center, 4-1-1 Sannomaru, Naka-ku, Nagoya 460-0001, Japan (E-mail: masahideo@aol.com).

J Thorac Cardiovasc Surg 2010;139:1659-61
0022-5223/\$36.00

Copyright © 2010 by The American Association for Thoracic Surgery
doi:10.1016/j.jtcvs.2009.09.054

FIGURE 1. A, Chest computed tomograph showing a small lymph node at the left paratracheal mediastinal region (arrow). B, Positron emission tomographic scan showing a hypermetabolic lesion in the left paratracheal mediastinal region.

region was anesthetized and examined with a standard bronchoscope, and then ultrasonic exploration was attempted with an EBUS bronchoscope (BF-UC260F-OL8; Olympus, Tokyo, Japan). After a balloon attached to the transducer of the EBUS bronchoscope was inflated with saline solution, we attempted to bring the transducer in touch with the tracheal wall to identify the left paratracheal lesion by means of a full upangulation of the flexible EBUS bronchoscope or even by changing the position of the patient from the supine to the left lateral position. However, the transducer could not be brought into good contact with the left lower tracheal wall, and the target lesion could not be visualized with EBUS.

Next we tried a transesophageal approach to examine the lesion. At the left lateral position, the EBUS bronchoscope was inserted and advanced through the esophagus to the stomach and then slowly withdrawn while examining the structure around the esophagus by means of ultrasonographic analysis. A small 7-mm lesion located in the left paratracheal region was identified and punctured through the

FIGURE 2. Transesophageal ultrasound-guided needle aspiration for the left paratracheal lymph node with an endobronchial ultrasound bronchoscope. #4L LN, Left paratracheal lymph node; Ao, aorta; PA, pulmonary artery.

esophagus with a 22-gauge EBUS needle during real-time ultrasonographic guidance (Figure 2). On-site cytologic evaluation with a quick staining method (Diff-Quik; Koku-saishiyaku, Kobe, Japan) was then performed. Malignant cells were revealed on the first puncture, and therefore the examinations were terminated. Shortly afterward, the positive result of rapid on-site cytologic evaluation was confirmed by means of final cytologic interpretation on Papanicolaou stain. The patient is now undergoing chemotherapy and radiation therapy by the referring physician.

DISCUSSION

EBUS-TBNA, which can access the paratracheal, subcarinal, and hilar regions, and EUS-FNA, which can access the subcarinal, aortopulmonary window, and lower mediastinal regions, are complementary in the hilar/mediastinal staging of lung cancer. A few studies have compared the accuracy of EBUS-TBNA and EUS-FNA in mediastinal staging of lung cancer.^{2,3} A preliminary study² demonstrated the sensitivity of EBUS-TBNA, EUS-FNA, and their combination for the diagnosis of mediastinal lung cancer to be 85%, 80%, and 100%, respectively. Several years later, the other investigators³ reported a sensitivity of 69%, 69%, and 93%, respectively. These studies both demonstrated that the combination of EBUS-TBNA and EUS-FNA is more accurate than either procedure by itself.

The combination method has some drawbacks, such as the necessity of both a dedicated EBUS bronchoscope and a dedicated EUS endoscope with dedicated needles. Furthermore, most bronchoscopists might not yet be familiar with the handling of EUS endoscopes,⁵ and therefore an additional experienced endoscopist might also be needed to

perform the combination procedure. These matters increase the cost, and the combination procedure would not be available in most institutions. Although EUS endoscopes have some features, such as a larger working channel (which enables the use of larger needles), wider ultrasonic scanning range, and adjustability of the protruding needle angle, the basic mechanism is similar to that of EBUS bronchoscopes. Use of the EBUS bronchoscope in place of the EUS endoscope might therefore be reasonable to simplify the procedure.

In conclusion, the use of the EBUS bronchoscope in place of the EUS endoscope for EUS-FNA in the diagnosis of mediastinal lesions is feasible in certain cases. This technique allows simpler mediastinal staging with high accuracy.

References

1. Rintoul RC, Skwarski KM, Murchison JT, Wallace WA, Walker WS, Penman ID. Endobronchial and endoscopic ultrasound-guided real-time fine-needle aspiration for mediastinal staging. *Eur Respir J*. 2005;25:416-21.
2. Vilmann P, Krasnik M, Larsen SS, Jacobsen GK, Clementsen P. Transesophageal endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) and endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) biopsy: a combined approach in the evaluation of mediastinal lesions. *Endoscopy*. 2005; 37:833-9.
3. Wallace MB, Pascual JM, Raimondo M, Woodward TA, McComb BL, Crook JE, et al. Minimally invasive endoscopic staging of suspected lung cancer. *JAMA*. 2008;299:540-6.
4. Herth FJ, Eberhardt R, Krasnik M, Ernst A. Endoesophageal ultrasound-guided fine-needle aspiration (EUS-FNA) and endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) biopsy in the evaluation of mediastinal lesions using the EBUS-TBNA scope. *Chest Meeting Abstracts*. 2008;134:95003. Available at: <http://meeting.chestpubs.org/cgi/content/abstract/134/4/p95003>.
5. Janes SM, Spiro SG. Esophageal endoscopic ultrasound/endobronchial ultrasound-guided fine needle aspiration: a new dawn for the respiratory physician? *Am J Respir Crit Care Med*. 2007;175:297-9.

Subxiphoid epicardial left ventricular pacing lead placement is feasible

Takeyoshi Ota, MD, PhD,^a David Schwartzman, MD,^b and Marco A. Zenati, MD,^a Pittsburgh, Pa

CLINICAL SUMMARY

A 67-year-old woman, who had a longstanding history of symptomatic paroxysmal atrial fibrillation (AF) with rapid ventricular response intolerant of all pharmacotherapy, was referred for surgical epicardial lead placement for cardiac resynchronization therapy (CRT). Her medical history was significant for status-post left mastectomy for breast cancer, for which she was scheduled for left breast radiation therapy. Also, she had a right subclavian Mediport vascular access port (Cormed, Inc, Baltimore, Md) for chemotherapy. Since (1) the left infraclavicular area required radiation that precluded access for the transvenous lead placement on the left side, (2) the right subclavian Mediport access port also precluded access on the right side, and (3) irradiation would compromise wound healing of classic left thoracotomy approaches (eg, minithoracotomy, video-assisted thoracoscopy), we decided to perform the atrioventricular (AV)

node ablation followed by epicardial lead placement through a subxiphoid approach.

After successful AV node ablation in the electrophysiology laboratory, a 1-inch subxiphoid incision was performed and the subxiphoid cartilage was excised. The sternum was retracted cranially with a subxiphoid retractor (Rultract; Rultract Inc, Cleveland, Ohio) (Figure 1). The pericardium was opened with stay sutures. By use of a heart positioner (Pyramid Positioner; ESTECH, San Ramon, Calif), the heart was elevated and the posterolateral wall was exposed without interfering with hemodynamic parameters (Figure 1). Bipolar epicardial steroid-eluting leads (CapSure Epi-model4968; Medtronic, Inc, Minneapolis, Minn) were implanted on the posterolateral wall of the left ventricle with 5-0 polypropylene sutures. Impedance of the left ventricular lead was 602 ohms with a threshold of 2.5 V. Additional ventricular leads (Medtronic) were placed on the right ventricle by the same technique (impedance 545 ohms with a threshold of 2.5 V), and a pacing device (InSync III model 8042; Medtronic) was connected to these leads and implanted in the right upper quadrant of the abdominal wall.

The postoperative course was uneventful with no complication. At 3 months' follow-up, both leads provided an adequate synchronization for CRT and satisfactory impedance and threshold (impedance 552 and 622 ohms with thresholds of 1.0 V and 1.0 V), and the patient was doing well with episodes of sinus rhythm interspersed with AF. She was unaware of these transitions and was asymptomatic.

From the Divisions of Cardiac Surgery^a and Cardiology,^b University of Pittsburgh, Pittsburgh, Pa.

Disclosures: None.

Received for publication May 24, 2009; revisions received June 10, 2009; accepted for publication June 10, 2009; available ahead of print Oct 9, 2009.

Address for reprints: Marco A. Zenati, MD, Professor, Division of Cardiac Surgery, University of Pittsburgh, C700 PUH, 200 Lothrop St, Pittsburgh, PA 15213 (E-mail: zenatim@upmc.edu).

J Thorac Cardiovasc Surg 2010;139:1661-2
0022-5223/\$36.00

Copyright © 2010 by The American Association for Thoracic Surgery
doi:10.1016/j.jtcvs.2009.06.031