Peripheral Bronchoscopy Utilizing a Peripheral Bronchoscope with Radial Probe Endobronchial Ultrasound and Guide Sheath Kit for Diagnosis of a Left Upper Lobe Nodule

A Case Report by Dr. Alexander Chen

Case Report

A 74-year-old female was referred to the Interventional Pulmonology Outpatient Clinic for biopsy of a 1.2 cm left upper lobe nodule that was found during surveillance imaging performed for an anterior mediastinal lesion believed to be a thymoma. The case was referred to Thoracic Surgery, which requested tissue biopsy prior to consideration for surgical resection. A PET-CT was performed and showed no significant abnormality aside from the left upper lobe nodule, and the patient was scheduled for bronchoscopy. *(See Figure 1.)*

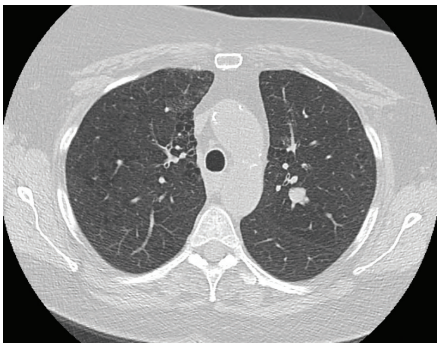

FIGURE 1

Procedure

Airway Inspection

The patient was brought to the Bronchoscopy Suite and was placed under moderate sedation using midazolam and fentanyl. The BF-P190 4.2 mm bronchoscope was advanced into the trachea to perform a standard airway inspection, which showed no significant abnormality.

Curvilinear Endobronchial Ultrasound

Following airway inspection, the Olympus BF-P190 bronchoscope was withdrawn, and the Olympus curvilinear endobronchial ultrasound (EBUS) bronchoscope BF-UC180F, powered by the EU-ME2 ultrasound processor, was advanced into the trachea to perform mediastinal and hilar surveillance for diagnostic and staging purposes. No significant mediastinal or hilar lymphadenopathy was identified, and therefore, peripheral bronchoscopy was performed for tissue diagnosis of the left upper lobe nodule.

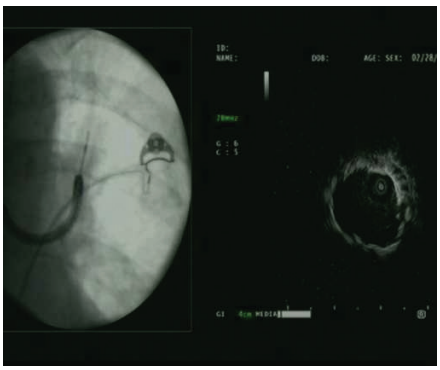

FIGURE 2

Radial Probe Endobronchial Ultrasound

Prior to insertion of the BF-P190 bronchoscope, the chest CT was reviewed and the left upper lobe nodule was isolated to a posterior branch of the apical-posterior segment (LB1+2) of the left upper lobe. The bronchoscope was advanced to the left upper lobe and the Olympus UM-S20-17S radial endobronchial ultrasound probe (Radial EBUS probe)—placed in an Olympus Guide Sheath (K-201)—was inserted into the working channel and advanced into a posterior branch of the left upper lobe apical-posterior subsegment. *(See Figure 2.)* A concentric ultrasound view of the left upper lobe nodule was obtained and the radial ultrasound probe was withdrawn, leaving the tip of the Guide Sheath in position, immediately proximal to the nodule. A cytology brush (supplied with the K-201 Guide Sheath Kit) was advanced to the left upper lobe nodule through the Guide Sheath under fluoroscopic surveillance, and cytology brushings were performed. *(See Figure 3.)* Following brushing, 1.5 mm flexible forceps (supplied with the K-201 Guide Sheath Kit) were advanced to the left upper lobe nodule through the Guide Sheath under fluoroscopy to obtain transbronchial lung biopsies. *(See Figure 4 on reverse.)*

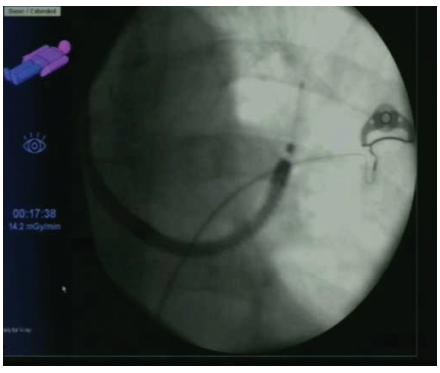

FIGURE 3

continued on reverse

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Rapid on-site evaluation of cytology brushings were positive for non-small cell carcinoma, and final pathology from transbronchial biopsies confirmed the finding of squamous cell carcinoma.

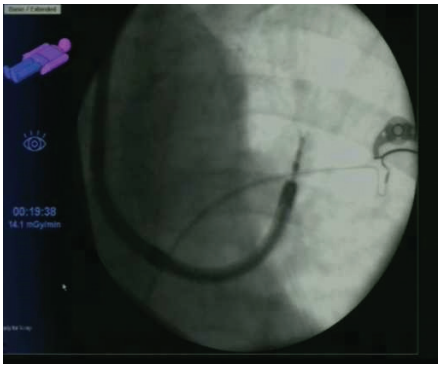

FIGURE 4

Discussion

The evaluation of peripheral pulmonary nodules continues to present challenges to the clinician. CT-guided biopsy has a relatively high diagnostic yield, though it may be complicated by pneumothorax. Surgical resection without a prior tissue diagnosis remains an option, though biopsies may be requested to potentially decrease the number of surgeries performed for nonmalignant disease. Advancements in bronchoscopy have improved the proceduralist's ability to access the lung periphery, bringing them closer to the target lesion and providing them with critical procedural feedback to ensure biopsies are being performed in the appropriate location.

In this case, the smaller-caliber BF-P190 bronchoscope allowed access to the mid lung through several generations of bronchi in a segment that is traditionally challenging to access using larger caliber bronchoscopes. Confirmation of the location of the left upper lobe nodule was performed using radial probe endobronchial ultrasound, and biopsy instruments were advanced directly to the nodule through the Guide Sheath that was left in place, acting as an extension of the tip of the bronchoscope to reach the nodule. Prior to tissue sampling, the insertion tube of the BF-P190 was rotated. This allowed the bronchoscopist's hand to return to near neutral position during the repeated insertion and removal of biopsy instruments, thereby reducing hand fatigue during the procedure.

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Dr. Chen is a paid consultant to Olympus corporation of the Americas (Olympus). Olympus did not draft, edit, or provide any substantive input on this Case Report.

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Printed in USA OAIRES0514WP13392