Endobronchial ultrasonographically guided transbronchial needle aspiration in mediastinal abscesses

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Mediastinal abscess is a serious condition carrying a high mortality and requiring surgical intervention. Real-time endobronchial ultrasonographically guided transbronchial needle aspiration (EBUS-TBNA), which is used for obtaining mediastinal tissue samples, is a safer and less invasive method than surgery.1 Here we present 2 cases of patients with mediastinal abscess diagnosed by EBUS-TBNA and discuss the related issues.

References
CLINICAL SUMMARIES

Patient 1
A 67-year-old man was admitted for lung adenocarcinoma with brain metastasis. During his hospitalization, fever and dyspnea developed. A chest radiograph revealed a new lesion overlying the right upper lobe of the lung (Figure 1, A). Chest computed tomography (CT) showed a heterogeneous, hypodense lesion (diameter 5.8 cm) with an air-fluid level (Figure 1, D). Surgical intervention was contraindicated by the patient’s poor overall condition. EBUS-TBNA was therefore performed with the patient under conscious sedation. We identified a heterogeneous, hypoechoic, cystic lesion in the right paratracheal area by using EBUS-TBNA with a convex ultrasound transducer. Under real-time endobronchial ultrasonographic guidance, a 22-gauge needle (white arrow) was inserted into the lesion (Figure 1, B); the stylet was then removed, and an aspiration vacuum syringe with a 3-way tap was used to apply negative pressure to the aspiration needle. Yellowish, cloudy pus (10 mL) was then aspirated into a vacuum syringe (Figure 1, C). We completed the procedure in approximately 30 minutes, and the patient tolerated the procedure well. Rapid on-site cytopathologic examination showed numerous pus cells and gram-negative bacilli without malignant cells. Subsequent pus cultures yielded *Klebsiella pneumoniae*. The patient received a 6-week course of appropriate antibiotics on the basis of antimicrobial sensitivity test results. The fever and dyspnea gradually subsided, and the size of the lesion decreased (Figure 1, E) 1 month later.

Patient 2
A 63-year-old woman was seen for a month-long history of productive cough and progressive dyspnea. Her chest CT scan revealed a large subcarinal cystlike lesion (Figure 2, A). The EBUS-TBNA procedure was applied to determine the etiology, and the endobronchial ultrasonographic image showed a heterogeneous, hypoechoic, cystic lesion over the subcarinal region (Figure 2, C). Under real-time endobronchial ultrasonographic guidance, a 22-gauge needle was punctured into the lesion (Figure 2, D, white arrow), and small amount of yellowish turbid fluid was aspirated from the lesion with the aspiration vacuum syringe. A rapid on-site cytopathologic examination showed many inflammatory cells and necrotic materials but no malignant cells. Acid-fast bacilli were detected, and the diagnosis was finally confirmed by the detection of *Mycobacterium tuberculosis* in the pus culture. After 6 months of antituberculosis medication therapy, a follow-up chest CT showed a reduction in the size of the mediastinal lesion (Figure 2, B).
DISCUSSION

Early and accurate identification of the mediastinal pathogen, complete surgical resection, and adjuvant systemic antibiotic therapy are recommended for the management of mediastinal abscesses; however, surgery and general anesthesia pose a high risk in patients with a poor health status. CT-guided percutaneous drainage has been proposed as an effective alternative to surgery, but it may involve a high risk of serious mediastinal complications and excessive exposure to radiation. There are a few published reports on the application of EBUS-TBNA in the diagnosis and partial treatment of mediastinal cysts; however, this diagnostic modality has not previously been used in interventions for mediastinal abscesses.

In our 2 cases, the EBUS-TBNA system equipped with a convex probe enabling color Doppler study helped to locate and characterize the mediastinal abscess and to distinguish it clearly from adjacent vascular structures. In addition, the system provides real-time visualization when the aspiration needle is advanced through the bronchial wall into the target lesion, thereby guaranteeing precision in approaching the lesion site. We used a 22-gauge needle for aspiration and inserted it at the target abscess site; the abscess tissue was collected by slowly moving the needle back and forth inside the lesion. Because a negative pressure was created by using an aspiration vacuum syringe, the dense, heterogeneous contents of the abscess could be drained through the working channel of a flexible bronchoscope, thereby increasing the amount of specimen obtained for microbiologic analysis.

Moreover, the EBUS-TBNA system may allow better access to infectious mediastinal regions than CT-guided procedures or mediastinoscopy, and it also is less invasive with a shorter procedure time. This technique requires only mild sedation and local anesthesia for 30 minutes when performed by experienced bronchoscopists. The potential complication (bleeding) associated with the EBUS-TBNA system seldom occur under real-time visualization of the needle. Even if the vascular structure is punctured, it is usually inconsequential once the needle is
References


Dissected axillary artery cannulation in redo-total arch replacement surgery

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Despite the increased use of axillary artery cannulation in aortic surgery, extension of an aortic dissection into the axillary artery remains a relative contraindication to its use. Deleterious effects associated with false lumen cannulation are of real concern and particular consequence with the axillary artery. Blood flow into the false lumen at this level risks cerebral malperfusion because of the proximity of the cerebral vessels. We describe a case of successful transesophageal echocardiography–guided true lumen cannulation of a dissected axillary artery in the face of accompanying distal dissection into the femoral vessels during complex redo aortic arch surgery.

Axillary artery cannulation has become the preferred strategy for many surgeons when reconstructing the ascending aorta or the aortic arch. Key benefits to axillary artery cannulation include the ability to maintain antegrade systemic blood flow during cardiopulmonary bypass, as well as enabling selective antegrade cerebral perfusion via positioning of a clamp onto the proximal innominate artery. Although contraindications to this technique are few, an aortic dissection that extends into the axillary artery is a perceived relative contraindication to its use. Typically, the lumen of an arterial dissection is predominantly that of the false lumen, with the true lumen relegated to less than 50% of the original diameter. With the smaller diameter of the axillary artery, access to the true lumen in the face of a dissection can be rather challenging. Undetected cannulation of the false lumen with the establishment of cardiopulmonary bypass has the potential to be catastrophic, causing severe cerebral malperfusion. Still, in situations in which alternative arterial access is prohibitive, true lumen cannulation of a dissected vessel can be an invaluable technique. We report a case of successful transesophageal echocardiography–guided true lumen cannulation of a dissected axillary artery in a patient with chronic aneurysmal dissection of the aortic arch and descending thoracic aorta several years after a previous ascending aortic repair for a DeBakey type I aortic dissection.

CLINICAL SUMMARY

A 60-year-old African American man with a medical history of poorly controlled essential hypertension, 12 years after ascending aorta and hemiarch repair of a DeBakey type I aortic dissection in conjunction with an aortic valve resuspension, presented to the hospital with shortness of breath. Cardiac workup revealed new-onset atrial fibrillation, severe aortic insufficiency with aortic root dilatation,