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Mediastinitis and pericarditis after endobronchial ultrasound-guided transbronchial needle aspiration

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Abstract

A 73-year-old man was admitted to our hospital for further investigation of multiple lung nodules and lymphadenopathy that were observed on chest radiography. Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) was performed to sample the lower paratracheal lymph node (4R), leading to a definitive diagnosis of squamous cell carcinoma of the lung. About 2 weeks after EBUS-TBNA, the patient had a high temperature, anterior chest pain, tachycardia, and hypotension. The diagnosis of infectious mediastinitis and pericarditis as complications of EBUS-TBNA, which were successfully treated with systemic antibiotics, was made after examinations. EBUS-TBNA is minimally invasive and useful for the diagnosis of hilar and mediastinum lesions particularly in determining the extent of lung cancer. With the increased employment of this method, critical complications may also increase. Clinicians should be aware of the rare but critical complications associated with EBUS-TBNA.

Introduction

Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is a minimally invasive method for the diagnosis of metastases in the peritracheal and peribronchial lymph nodes in patients with lung cancer. It has been demonstrated that complications associated with this technique are rare [1]; however, with the increasing adoption of this method, the number of critical complications may increase. We report herein a case of infectious mediastinitis and pericarditis as complications of EBUS-TBNA.

Case Report

A 73-year-old Japanese man with a 20-year history of diabetes mellitus complicated by end-stage renal disease secondary to diabetic nephropathy was referred to our hospital. His chest X-ray and computed tomography (CT) showed diffuse multiple lung nodules and lymphadenopathy. The patient had a past medical history of cerebral infarction 5 years previously and underwent total gastrectomy 2 years previously because of gastric cancer. He was an ex-smoker with a 150 pack-year history. He was asymptomatic and his lungs were clear on auscultation. Other findings on physical examination were normal except for slight anemia seen in both conjunctivae. Laboratory findings on admission were as follows: hemoglobin of 67 g/L, a white blood cell count (WBC) of 7.8×10^9/L, blood urea nitrogen level of 34 mmol/L, and creatinine level of 681.5 μmol/L. After admission, hemodialysis was introduced due to his end-stage renal failure secondary to diabetes. The patient underwent EBUS-TBNA (BF-UC160F-OL8; Olympus, Tokyo, Japan) with sedation using midazolam. Chest CT showed that the lower paratracheal lymph node (4R) was about 18×25 mm in size (Fig. 1). After detecting the 4R lymph node using ultrasound, five transbronchial aspirations were performed with a 22-gauge needle. Because we could not obtain adequate samples until fourth puncture and it took a longer time than usual for the procedure, no other lymph nodes were punctured.

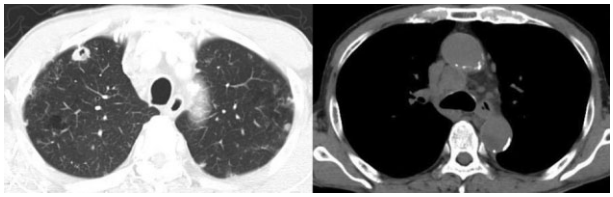

Figure 1. Chest computed tomography before endobronchial ultrasound-guided transbronchial needle aspiration. (Left panel) A nodule in the right upper lobe with thickened wall and cavitation was suspected as a primary lesion. Solid nodules in the left upper lobe were considered as metastases. (Right panel) Enlarged lower paratracheal lymph node (4R) was seen.

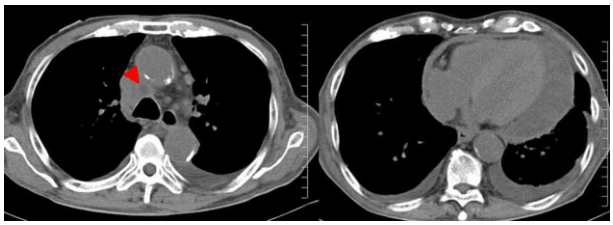

Figure 2. Thirteen days after endobronchial ultrasound-guided transbronchial needle aspiration, chest computed tomography showed swelling of the 4R lymph node, elevation of mediastinal fat concentration (arrow), and a moderate pericardial effusion.

The presence of squamous cell carcinoma cells was detected through EBUS-TBNA by puncturing the lower paratracheal lymph node (4R). As a result of systemic examinations, he was found to have stage IV (cT1a N2 M1a) squamous cell carcinoma of the lung with multiple lung metastases (Fig. 1).

Eleven days after EBUS-TBNA, the patient suddenly suffered from fever of 39°C, chest pain, tachycardia, and hypotension. Electrocardiogram showed low voltage and ST segment elevation in a wide range of leads. Chest CT showed enlargement of 4R lymph node with low attenuation areas (30×32 mm in size), elevation of mediastinal fat concentration, and a moderate pericardial effusion (Fig. 2). Laboratory testing revealed a WBC of 14.6×10^9/L, C-reactive protein level of 22.53×10^4 μg/L, and procalcitonin level of 17.84 μg/L (normal, <0.5), leading to the diagnosis of acute mediastinitis and pericarditis associated with EBUS-TBNA.

Pericardial drainage was not necessary because the amount of pericardial effusion was low at the front wall of the heart. The patient's general condition gradually improved with antibiotic treatment. Two weeks after the start of antibiotic therapy, the procalcitonin level returned to normal, and 30 days after the start of antibiotics, the 4R lymph node decreased to 20×24 mm in size as did the amount of pericardial effusion. The patient made a favorable recovery and was discharged 44 days after the beginning of antibiotic therapy.

Discussion

In patients with lung cancer, precise diagnosis and staging of the disease are essential to determine the appropriate treatment. EBUS-TBNA has been reported to have high sensitivity and specificity in the diagnosis of metastasis in the hilar and mediastinal lymph nodes [2]. In addition, no severe complications of EBUS-TBNA were reported in a meta-analysis [1].

However, with the widespread use of EBUS-TBNA, sporadic reports of complication have increased. In a Japanese survey of 7345 cases of EBUS-TBNA, the complication rate was 1.23%, and the frequency of infectious complications was 0.19%, including mediastinitis in seven cases, pericarditis in one, pneumonia in four, cyst infection in one and sepsis in one [3]. It was reported that the mediastinal infection was due to inoculation of oral commensals into the target lesion by repeated stabbing of the puncture needle through the working channel of the bronchoscope [4]. In the present case, it was difficult to obtain adequate samples during EBUS-TBNA. Repeated punctures and a long procedure time might have led to the mediastinal infection.

Antibacterial prophylaxis is not recommended in routine diagnostic bronchoscopy, except for cases with splenic removal, a prosthetic heart valve, or a previous history of endocarditis [5]. No consensus has been reached on antibacterial prophylaxis for EBUS-TBNA; however, this patient was thought to be in an immunocompromised state due to diabetes mellitus, hemodialysis, and total gastrectomy with spleen removal. Therefore, antibacterial prophylaxis after EBUS-TBNA should have been considered. If patients undergoing EBUS-TBNA are in an immunocompromised state, antibacterial prophylaxis should be considered.

In conclusion, we reported a patient who developed mediastinal infection as a complication of EBUS-TBNA that was successfully treated with antibiotics. Although EBUS-TBNA is minimally invasive and a useful procedure for the diagnosis of hilar and mediastinum lesions, clinicians must be aware of this rare but critical complication.

Disclosure Statements

No conflict of interest declared.

Appropriate written informed consent was obtained for publication of this case report and accompanying images.

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