

Severe Mediastinal Abscess after Endobronchial Ultrasound with Transbronchial Needle Aspiration

Jing-Hong Dai¹, Lu-Lu Chen¹, Hui Li¹, Li-Yun Miao¹, Rui Li¹, Li Gao¹, Fan-Qing Meng², Hou-Rong Cai¹

¹Department of Respiratory Medicine, Nanjing Drum Tower Hospital Affiliated to Medical School of Nanjing University, Nanjing, Jiangsu 210008, China

²Department of Pathology, Nanjing Drum Tower Hospital Affiliated to Medical School of Nanjing University, Nanjing, Jiangsu 210008, China

Endobronchial ultrasound with transbronchial needle aspiration (EBUS-TBNA) is a minimally invasive and safe technique which is universally accepted for the mediastinum and/or hilum lymph node biopsy. Severe infectious complications following EBUS-TBNA were occasional, but sometimes life-threatening.^[1] Two patients with severe mediastinal abscess after EBUS-TBNA were treated successfully with surgical drainage in our department, and we reported here to improve our clinical vigilance to this disease.

A 59-year-old Chinese man experienced chest pain combined with a cough for about 4 months. Chest computed tomography (CT) was performed in other hospital and showed right hilum expansion and mediastinum lymph node enlargement. EBUS-TBNA (UC260FW, Olympus, Tokyo, Japan) was performed to puncture the right tracheobronchial lymph node (#4R) under pharynx nasalis local anesthesia with lidocaine on July 03, 2015. Moreover, this patient was pathologically diagnosed with lung adenocarcinoma through using EBUS-TBNA specimens [Figure 1a].

Three days after EBUS examination (July 06, 2015), the patient developed a high fever, increased the degree of cough and chest pain. He was admitted to our department. Blood examination showed that white blood cell count (WBC) was normal with the increased ratio of neutrophils, and C reactive protein (CRP) was increased. Echocardiographic showed a little pericardial effusion. Chest CT (July 08, 2015) showed an enlargement of the right tracheobronchial lymph node, with some air-like low-density shadow in it [Figure 1b], and a small amount of pericardial effusion [Figure 1c]. We then diagnosed him with possible mediastinal infection because of a patient with suspicious lymph node abscess and fever plus increased CRP level. Moxifloxacin was used as initial antibiotics to treat the infection, but high fever persisted. The 7th day after admission (July 10, 2015), the patient's blood pressure dropped off to 67/43 mmHg even after resuscitation with adequate fluid infusion. Echocardiography was performed

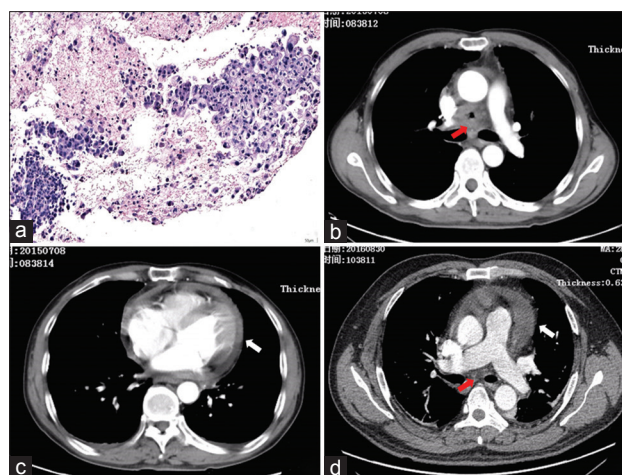


Figure 1: (a) Histopathology of the biopsied specimen, pathological diagnosis was lung adenocarcinoma (H&E staining, original magnification $\times 200$); (b and c) computed tomography imaging of mediastinal abscess in case 1, performed on 5 days of EBUS-TBNA, showed an enlargement of the right tracheobronchial lymph node, with some air-like low-density shadow in it (red arrow), and a small amount of pericardial effusion (white arrow); (d) computed tomography imaging of mediastinal abscess in case 2, performed on 25 days of EBUS-TBNA, showed a cystic mass in posterior mediastinum (red arrow), moderate pericardial effusion (white arrow), and bilateral pleural effusion. EBUS-TBNA: Endobronchial ultrasound with transbronchial needle aspiration.

and showed high amount of pericardial effusion. Then, septic shock induced by mediastinal abscess or pericardial tamponade was considered. Antibiotics in combinations using intravenous imipenem and teicoplanin were prescribed and emergent

Address for correspondence: Dr. Hou-Rong Cai,
Department of Respiratory Medicine, Nanjing Drum Tower Hospital
Affiliated to Medical School of Nanjing University, Nanjing,
Jiangsu 210008, China
E-Mail: caihourong2013@163.com

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

© 2018 Chinese Medical Journal | Produced by Wolters Kluwer - Medknow

Received: 08-09-2017 **Edited by:** Yi Cui

How to cite this article: Dai JH, Chen LL, Li H, Miao LY, Li R, Gao L, Meng FQ, Cai HR. Severe Mediastinal Abscess after Endobronchial Ultrasound with Transbronchial Needle Aspiration. Chin Med J 2018;131:357-8.

Access this article online

Quick Response Code:



Website:
www.cmj.org

DOI:
10.4103/0366-6999.223848

pericardial fenestration was performed under general anesthesia. About 800 ml of pus was drained from the pericardial cavities. Antibiotics were continued to use for about 4 weeks after the operation. The body temperature was gradually decreased to normal, and the inflammation indexes such as CRP and WBC decreased within normal values; reexamination on echocardiography showed no pericardial effusion existing; chest CT (August 13, 2015) showed an enlargement of the right tracheobronchial lymph node without air-like low-density shadow, a few amount of pericardial effusion and no pleural effusion; the patient was discharged; and one month later, he received anti-cancer chemotherapy.

The second patient was a 52-year-old Chinese man who denied any chronic disease histories. In his yearly routine medical examination, chest CT (August 04, 2016) revealed a cystic mass in the posterior mediastinum. EBUS-TBNA was performed to puncture the subcarinal lymph node (#7) on August 17, 2016. Pathological examination of EBUS-TBNA specimens showed some cellulose-like degeneration materials and no malignant or granulomatous findings. The diagnosis was mediastinal cysts.

The patients experienced chest pain, a slight fever, and had an episode of syncope after 25 days from the EBUS-TBNA (August 29, 2016). He returned to our hospital and was admitted in cardiological care unit with initially diagnosis of the acute coronary syndrome (ACS). Blood examinations showed us increased WBC, CRP, and erythrocyte sedimentation rate (ESR). Echocardiography showed moderate pericardial effusion. Chest CT (August 30, 2016) demonstrated a mass in posterior mediastinum with moderate pericardial effusion and bilateral pleural effusion [Figure 1d]. Based on the above symptoms and examinations, acute pericarditis and mediastinal abscess were considered. Under general anesthesia and extracorporeal circulation, pericardial fenestration was performed using thoracoscopy and about 800 ml of pus was drained. Intravenous cefoperazone sodium was administered for one more week after the operation, and chest CT (September 06, 2016) was rerun and demonstrated a cystic mass in posterior mediastinum without pericardial and bilateral pleural effusion. The patient recovered and discharged after then.

Infectious complications (mediastinitis, pneumonia, pericarditis, cyst infection, and sepsis) after EBUS-TBNA were rare with the incidence of 0.19%, among them, mediastinitis was accounted for 0.10% of these cases.^[2] Symptoms of mediastinal abscess were nonspecific including fever, new productive cough, chest pain, hemoptysis, shortness of breath, and arrhythmia. Differential diagnosis should rule out, including ACS. In some cases, the symptoms manifested relatively late even 60 days after manipulation of EBUS-TBNA.^[3] Clinical consciousness and awareness of observing the signs of infection were important to diagnose this infrequent complication after the operation. Blood examination often indicated an inflammatory process with elevated WBC, CRP, and ESR. Echocardiography and chest CT showing enlargement of lymph node with an inner low-density shadow and pericardial effusions could provide key clues for the diagnosis of mediastinal infection.

Previous studies reported that the most common bacteria identified in mediastinal abscess were of oropharyngeal origin, such as *Klebsiella pneumoniae*, *Actinomyces*, hemolytic *Streptococcus*, and *Streptococcus intermedius*, suggesting that the translocation of oral and nasopharyngeal bacteria to deep mediastinal tissues through the transbronchial or transtracheal passage of the needle were the most possible causes of mediastinitis or mediastinal abscess.^[4] In addition, the infection may also be caused by bacteremia spread through the punctured wound. When the puncture site was necrotic or cystic, blood flow was slight that was convenient for bacteremia colonization and dissemination.^[5] Therefore, ensuring with the right location of the needle tip was very important. Further investigation should be carried out to investigate whether prophylactic antibiotic should be routinely prescribed after EBUS-TBNA.

Mortality associated severe infectious complications have been reported.^[1] Indeed, in our two patients, hypotension had occurred due to septic shock or pericardial tamponade in one case, and an episode of syncope occurred in another. Even broad-spectrum antibiotics were administered; surgical drainages were more effective to control the infections.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

The study was supported by the National Natural Science Foundation of China (81570058), Jiangsu Provincial Medical Talent, Jiangsu Social Development Project (BE2017604, ZDRCA2016058).

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Lee HY, Kim J, Jo YS, Park YS. Bacterial pericarditis as a fatal complication after endobronchial ultrasound-guided transbronchial needle aspiration. *Eur J Cardiothorac Surg* 2015;48:630-2. doi: 10.1093/ejcts/ezu477.
2. Asano F, Aoe M, Ohsaki Y, Okada Y, Sasada S, Sato S, *et al.* Complications associated with endobronchial ultrasound-guided transbronchial needle aspiration: A nationwide survey by the Japan Society for Respiratory Endoscopy. *Respir Res* 2013;14:50. doi: 10.1186/1465-9921-14-50.
3. Huang CT, Chen CY, Ho CC, Yu CJ. A rare constellation of empyema, lung abscess, and mediastinal abscess as a complication of endobronchial ultrasound-guided transbronchial needle aspiration. *Eur J Cardiothorac Surg* 2011;40:264-5. doi: 10.1016/j.ejcts.2010.11.037.
4. Yokoyama Y, Nakagomi T, Shikata D, Higuchi R, Oyama T, Goto T, *et al.* Surgical treatment for mediastinal abscess induced by endobronchial ultrasound-guided transbronchial needle aspiration: A case report and literature review. *World J Surg Oncol* 2017;15:130. doi: 10.1186/s12957-017-1206-4.
5. Haas AR. Infectious complications from full extension endobronchial ultrasound transbronchial needle aspiration. *Eur Respir J* 2009;33:935-8. doi: 10.1183/09031936.00025708.