Acute Pericarditis and Mediastinal Lymph Node Abscess Developing After Endobronchial Ultrasound Guided Transbronchial Needle Aspiration

Shingo Nishikawa¹, Ryo Ariyasu¹, Tomoaki Sonoda¹, Masafumi Saiki¹, Takahiro Yoshizawa¹, Yosuke Dotstu¹, Junji Koyama¹, Ken Uchibori¹, Satoru Kitazono¹, Noriko Yanagitani¹, Atsushi Horiike¹, Fumiyoshi Ohyanagi², Makoto Nishio¹*

¹Department of Thoracic Medical Oncology, The Cancer Institute Hospital, Japanese Foundation for Cancer Research, Japan
²Department of Respiratory medicine, Jichi Medical University Saitama Medical Center, Japan

Abstract

A 27-year-old man was diagnosed with inflammatory myofibroblastic tumor, and multiple lymph node and subcutaneous metastases. After several administrations of anti-tumor therapy, he underwent mediastinal lymph node biopsy using endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) to confirm tumor relapse. Five weeks later, he complained of chest pain, then rapidly developed shock due to acute pericarditis. Although he was treated with antibiotics for anaerobic bacterial infection and cardiac drainage, mediastinal lymph node abscess and pericarditis did not improve. After the surgical procedure, his physical condition dramatically improved and he was treated with another molecularly targeted therapy. Tumor response was obtained and has continued for 4 months. This case involved bacterial mediastinal lymph node abscess following pericarditis due to EBUS-TBNA and the patient recovered after drainage and surgical treatment. Pericarditis associated with EBUS-TBNA is extremely rare. Resident bacteria in the oral cavity may have migrated into mediastinal lymph nodes during EBUS-TBNA and then spread to the pericardium. The long period of five weeks to the onset of pericarditis and rapid progression after that onset appear attributable to slow growth of lymph node abscess caused by anaerobic bacteria that survived insufficient antibiotic treatment after EBUS-TBNA, then lymph node abscess rupture to the pericardium. In this case, salvage was achieved by surgical drainage of the lymph node abscess and pericarditis, and long survival was obtained with further administration of anti-tumor treatment.

Case report

A 27-year-old man was referred to our hospital with dyspnea, tumor in the left lower lobe of the left lung, and multiple mediastinal lymphadenopathies and subcutaneous tumors in December 2016. Transbronchial lung biopsy was performed and pathological examination suggested inflammatory myofibroblastic tumor (IMT) with anaplastic lymphoma kinase (ALK) fusion gene. He received alectinib as an ALK-tyrosine kinase inhibitor for 5 months, then chemotherapy with cisplatin, pemetrexed and nivolumab for 4 months according to the treatment protocol for ALK-positive non-small cell lung cancer (NSCLC). However, regrowth of the tumors was observed and re-biopsy of mediastinal lymph nodes with EBUS-TBNA was performed to compare pathological findings with prior specimens. After 1 cycle of docetaxel, ceritinib (a second-generation ALK-tyrosine kinase inhibitor) was administered. On Day 8 of treatment, he complained of anterior chest and left shoulder pain. Vital shock developed and he was admitted to the intensive care unit (ICU).

Electrocardiography revealed ST elevation in leads V2-V4, suggesting pericarditis. Chest computed tomography (CT) and cardiac ultrasonography (UCG) showed pericardial effusion suggestive of cardiac tamponade, and pericardial drainage was immediately performed (Figures 1 and 2). CT showed mediastinal lymphadenopathy sug-
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suggesting mediastinal lymph node abscess.

Figure 1: A) CT shows rupture of mediastinal abscess and pus escaping from the fistula (red arrow). B) Pericardial effusion is apparent (white arrows).

Figure 2: A) The electrocardiogram shows ST elevation in leads V2-V4 several hours after symptom onset, representing a characteristic finding of pericarditis. B) Continued pericardial effusion (※) is confirmed by cardiac ultrasound test. C) In the surgical findings, pus from the lymph node abscess (white arrow) is seen through the mediastinum. Incision was later used to achieve abscess drainage.

Bacterial cultures of pericardial fluid yielded Streptococcus salivarius, Prevotella loescheii, Peptostreptococcus micros, and Peptostreptococcus magnus, all of which are bacteria indigenous to the oral cavity.

We therefore considered that the acute bacterial pericarditis was caused by perforation of a mediastinal lymph node abscess, which in turn was attributable to EBUS-TBNA.

Although he received meropenem, which all cultured bacteria had shown sensitivity to, mediastinal lymph node abscess and pericardi-tis did not improve. Surgical pericardial fenestration and mediastinal lymph node abscess drainage was therefore performed (Figure 2c). After the surgical procedure, his physical condition improved dramatically and he was discharged from the ICU 6 days postoperatively. Treatment with ceritinib was resumed and tumor response was obtained. As of the time of writing, ceritinib has been continued for 4 months.

Discussion

In this case, we encountered bacterial mediastinal lymph node abscess following pericarditis due to EBUS-TBNA, and the patient recovered with drainage and surgical treatment. Pericarditis is considered to involve secondary infection by viruses and bacteria, autoimmune diseases or trauma. NSAIDs, colchicine and antibiotics are used for bacterial pericarditis [1]. When pericardial effusion increases, drainage is sometimes required.

EBUS-TBNA is a very useful method for diagnosing mediastinal and hilar lymph node metastases from a primary lung cancer [2]. Although some complications associated with EBUS-TBNA have been reported, such as hemorrhage, mediastinitis and pneumonia, pericarditis is extremely rare, occurring in 0.01% of EBUS-TBNA cases [3]. A few reports of pericarditis due to EBUS-TBNA or other forms of needle biopsy have been reported, all involving bacterial pericarditis with bacteria indigenous to the oral cavity (Table 1) [4-7]. In our case, Streptococcus salivarius, Prevotella loescheii, Peptostreptococcus micros, and Peptostreptococcus magnus were identified from drainage of pericardial fluid and lymph nodes. Bacteria resident in the oral cavity initially migrated into mediastinal lymph nodes when EBUS-TBNA was performed and then spread to the pericardium. A relatively long period (5 weeks after EBUS-TBNA) passed until the onset of pericardium, but progression after onset was then rapid as compared with previous reports.

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Age (y), sex</th>
<th>Culture result of pericardial fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epstein, et al.</td>
<td>63, M</td>
<td>Streptococcus milleri, alpha-hemolytic Streptococci, Bifidobacterium species, Bacteroides ureolyticus, unidentified Gram-positive rods</td>
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<tr>
<td>Mitchell, et al.</td>
<td>65, M</td>
<td>Staphylococcus aureus</td>
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<td>Haas, et al.</td>
<td>50, M</td>
<td>Actinomyces odontolyticus, Streptococcus mutans</td>
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</tbody>
</table>
Lee, et al. 55, F  Streptococcus viridans
54, M  Group C beta-hemolytic Streptococcus species

Matsumoto, et al. 48, M  Streptococcus constellatus

Present case 27, M  Streptococcus salivarius, Prevotella loescheii, Peptostreptococcus micros, Peptostreptococcus magnus

TBNA: Transbronchial Needle Aspiration

| Table 1: Previous reports that identified causative species for bacterial pericarditis due to TBNA |
|---|---|
| One reason for the slow growth of lymph node abscess was considered to be the survival of anaerobic bacteria with insufficient antibiotic treatment after EBUS-TBNA and then rupture of the lymph node abscess to the pericardium. |
| Broad-spectrum antibiotics should be used, because mixed infection with anaerobic and aerobic bacteria is often present. In this case, we immediately used meropenem and performed percutaneous pericardial drainage, but the mediastinitis and pericarditis could not be controlled. In this case, the patient was salvaged with surgical drainage of the lymph node abscess and pericardium. In addition, the patient was able to be treated again with ceritinib and achieved long survival after these events. Surgical treatment should thus be performed at appropriate times if fever and inflammatory reactions persist after drainage. |
| In conclusion, care is required over the long term regarding the development of lymph node abscess and pericarditis after EBUS-TBNA. |

Conflicts of Interest

Dr. Nishio has received research funding from Novartis, ONO Pharmaceutical, Chugai Pharmaceutical, Bristol-Myers Squibb, TAIHO Pharmaceutical, Eli Lilly, Pfizer, Astellas Pharma and AstraZeneca, and honoraria from Pfizer, Bristol-Myers Squibb, ONO Pharmaceutical, Chugai Pharmaceutical, Eli Lilly, TAIHO Pharmaceutical and AstraZeneca. Dr. Horiike has received research funding from Chugai Pharmaceutical, Quintiles, MSD Oncology, and Abbvie, and honoraria from Chugai Pharmaceutical, Eli Lilly, AstraZeneca, Pfizer, Boehringer Ingelheim, and ONO Pharmaceutical. Dr. Yanagitani has received honoraria from MSD Oncology, Bristol-Myers Squibb, and ONO Pharmaceutical. All remaining authors have declared no conflicts of interest.

References


