CASE REPORT

Infectious mediastinal lymphadenopathy after repeated transbronchial needle aspiration

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SUMMARY

A man in his 70s was diagnosed with squamous cell carcinoma (cT1aN2M0) by repeated transbronchial needle aspirations (one conventional and one using endobronchial ultrasonography) of the subcarinal lymph node. Shortly after the initiation of chemoradiotherapy, he began to have chest pain with a high fever. CT showed only subcarinal lymph node swelling. Treatment with several antibiotics was started, and his fever decreased gradually. Chest CT showed shrinking of the subcarinal lymph node, and a diagnosis of infectious lymphadenopathy was made. Infectious lymphadenopathy can be difficult to diagnose because the symptoms are often non-specific and CT findings are not useful in differentiating tumour growth.

BACKGROUND

The development of the endobronchial ultrasonography (EBUS) video-bronchoscope to allow real-time transbronchial needle aspirations (TBNA) has been a significant advance in lung cancer staging and diagnosis. However, since clinicians are more proactive during bronchoscopy, they should be aware of complications. A mediastinal lymph node infection is potentially life threatening. This article is a first report of a complication of EBUS-TBNA that limited to mediastinal lymph nodes.

CASE PRESENTATION

A man in his 70s was referred to our hospital because of an abnormal shadow on chest CT (figure 1). He was diagnosed with squamous cell carcinoma (cT1aN2M0, Stage IIb, 7th editions of the American Joint Committee on Cancer tumor-node-metastasis staging system) by repeated TBNAs of the subcarinal lymph node. The first TBNA, performed using conventional bronchoscopy, was negative. The second TBNA was performed using EBUS. Treatment with surgery was not indicated in this case since he had metastasis to mediastinal lymph nodes, complications of emphysema and a history of receiving partial right upper lung lobectomy for the treatment of tuberculosis. Therefore, chemoradiotherapy was started 3 days after the procedure.

OUTCOME AND FOLLOW-UP

On the fifth day of chemoradiotherapy, he began to experience pain in his right anterior chest and developed a high fever. Physical examination and laboratory tests indicated an infectious disease. Whole-body CT revealed no foci of infections other than subcarinal lymph node swelling;

however, we could not judge whether this indicated disease progression of the lung cancer or infection of subcarinal lymph node. Intravenous administrations of antibiotics were started. Subsequently, a disorder of consciousness developed (Glasgow Coma Scale 13 of 15, eye opening, 3; motor response, 4; and verbal response, 6) and bacterial meningitis was suspected. His fever decreased gradually, but the disorder of consciousness remained. CT taken on 14th day after administration of antibiotics showed shrinkage of the subcarinal lymph node (figure 2), but brain MRI showed multiple metastases in the brain.

DISCUSSION

Conventional TBNA has been performed for 20 years and is considered safe, with few reported complications. In a meta-analysis by Holty *et al*¹, the pooled complication rate was 0.3%. The development of the EBUS video-bronchoscope to allow real-time TBNA has been a significant advance in minimally invasive lung cancer staging and diagnosis. Its diagnostic accuracy is at least equivalent to that of mediastinoscopy and significantly greater for certain lymph node stations.² A recently published meta-analysis found no published study reporting serious complications.³

The case presented here was diagnosed as infectious mediastinal lymphadenopathy induced by TBNA. Three recently published case studies reported infective complications after EBUS-TBNA.^{4–6} Steinfert *et al*⁷ collected blood samples within 60s of EBUS-TBNA in 43 patients; aerobic and anaerobic blood cultures revealed bacteraemia in three patients (7%). All bacterial isolates were typical oropharyngeal commensal organisms, suggesting that bacteraemia following EBUS-TBNA is not uncommon. Haas⁵ reported an infectious complication after EBUS-TBNA of the tumour bed, including the right paratracheal lymph node. In that case, chest CT showed an enlarged lymph node with multiple air bubbles. No case has previously been reported with a complication limited to the mediastinal lymph node.

18F-fluorodeoxyglucose-positron emission tomography (FDG-PET) scan is useful in evaluating the extent of cancer. It was performed at the time of diagnosis, and showed high uptake around the tumour site and enlarged subcarinal lymph node. The patient did not receive additional 18-FDG-PET. Since 18-FDG-PET may misdiagnose tumour growth as infection or inflammatory changes after chemoradiation, we did not use it to evaluate the lymphadenopathy.^{8,9}

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Figure 1 (A) Chest radiograph on the day of admission. (B) Reticular shadow in both lower lobes, and nodule in the right middle lobe. (C) Subcarinal lymphadenopathy.

The time course of the development and disappearance of subcarinal lymphadenopathy (figure 2) was helpful in differentiating between infectious and cancerous processes. The mediastinal lymph node enlarged only 4 days after the initiation of systemic chemotherapy and irradiation, and it shrunk after 18 days of antibiotic treatment without cancer treatment. In case studies of infectious complications after EBUS-TBNA, the

time interval from TBNA to diagnosis was relatively long, 9 days to nearly 2 months.^{4–6} Sang-Won Um *et al*¹⁰ reviewed the clinical characteristics of fever after bronchoscopy in 518 patients, and postbronchoscopy fever was most typically seen at approximately 8 h (range, 4–24 h) after procedures. We diagnosed subcarinal lymphadenopathy 9 days after EBUS-TBNA and 14 days after the first TBNA. This seems to be an unusually

Figure 2 Time course of CT findings for the subcarinal lymph node. Day 1, on admission. Day 10, CT for planning radiation therapy. Day 16, CT for examination for cause of fever up to 39°C; antibiotics were started from the previous day. Day 35, CT for follow-up examination; the previously enlarged subcarinal lymph node has actually shrunk.

long time for the development of infection after conventional bronchoscopy, but may be a reasonable time after EBUS-TBNA.

Current guidelines from the American Heart Association for the prevention of infective endocarditis recommend antibiotic prophylaxis for bronchoscopic procedures only in patients with cardiac conditions associated with the highest risk of adverse outcome from endocarditis.¹¹ However, bronchoscopists should be aware that rare, but serious, complications may occur, and each patient should be closely monitored for the development of signs and symptoms of infection after EBUS-TBNA. There is also a need to identify procedure-related risk factors, the true incidence and the pathogens involved. Antibiotic prophylaxis appears to be a reasonable choice to avoid infectious lymphadenopathy after EBUS-TBNA in certain cases.

Infectious lymphadenopathy can be a serious complication of EBUS-TBNA. It can be difficult to diagnose because symptoms are often non-specific and CT findings are not necessarily useful in the differentiation of tumour growth. There is a need for further research regarding when to start antibiotics and whether to use antibiotics prophylactically.

Learning points

- ▶ Mediastinal lymphadenopathy induced by bronchoscopy is difficult to differentiate between infectious and cancerous processes.
- ▶ Development of infection after bronchoscopy may happen more than a week after the procedure.
- ▶ Antibiotic prophylaxis may be a reasonable choice to avoid infectious lymphadenopathy.

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