

Mediastinal cyst infection followed by bacteremia due to *Streptococcus anginosus* after endobronchial ultrasound-guided transbronchial needle aspiration

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Submission: 05-02-2020
Accepted: 17-02-2020
Published: 03-04-2020

Abstract:

We herein report a case of recurrent mediastinal cyst infection followed by bacteremia after endobronchial ultrasound-guide transbronchial needle aspiration (EBUS-TBNA). A 65-year-old Japanese male with sarcoidosis presented with 4 L progressive lymph node adenopathy and was diagnosed with mediastinal cyst by EBUS-TBNA. After bronchoscopy, he suffered from a high fever. Chest computed tomography showed enlargement of the 4 L lymph node with low attenuation areas, the elevation of mediastinal fat concentration. Blood cultures were positive for *Streptococcus anginosus*. Antimicrobial agents were administered for a total of 12 weeks, at which point the size of the lymph node was reduced. However, at 5 months after the discontinuation of antimicrobial agents, the mediastinal cyst infection recurred. It is important to conduct careful follow-up because mediastinal cyst infection following ebus-tbna may relapse with conservative treatment without invasive surgery.

Keywords:

Bacteremia, endobronchial ultrasound-guided transbronchial needle aspiration, Mediastinal cyst infection, *Streptococcus anginosus*

Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is a minimally invasive diagnostic method for mediastinal and hilar lymphadenopathy. Complications associated with EBUS-TBNA are extremely rare.^[1]

We herein report a case of recurrent mediastinal cyst infection followed by bacteremia due to *Streptococcus anginosus* after EBUS-TBNA and review the literature on bacteremia after EBUS-TBNA.

was admitted to our hospital. Twelve days before the presentation, he underwent EBUS-TBNA with sedation using midazolam for an enlarged mediastinal mass. After the 4 L lymph node was examined using ultrasound, three transbronchial aspirations were performed with a 22-gauge needle. An EBUS-TBNA biopsy showed mucus findings, so the nodule was considered a mediastinal cyst.

Three days before the admission, he suddenly developed a dry cough. Two days before admission, he developed a fever. He had a history of hyperlipidemia, hypertension, bronchial asthma, and sarcoidosis. He was not on any medication

Case Report

A 65-year-old Japanese male with sarcoidosis presented with a fever and dry cough and

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DOI:

10.4103/atm.ATM_42_20

How to cite this article: Hashimoto T, Ando M, Watanabe E, Kadota Ji. Mediastinal cyst infection followed by bacteremia due to *Streptococcus anginosus* after endobronchial ultrasound-guided transbronchial needle aspiration. Ann Thorac Med 2020;15:95-7.

other than amlodipine besylate and fluticasone furoate/vilanterol trifenatate inhalation. His body temperature was 38.8°C, blood pressure 99/73 mmHg, and pulse 101 beats/min. He had no cardiac murmurs, and his lungs were clear on auscultation, and other physical examinations revealed no remarkable findings. An arterial blood gas analysis revealed a pH of 7.46, PaO₂ of 72 mmHg, and PaCO₂ of 27 mmHg as well as a normal level of lactate (1.4 mmol/L) on room air. Laboratory tests revealed an elevated white blood cell count (10,080/μL), hypoalbuminemia (2.8 g/dL), an elevated C-reactive protein level (33.3 mg/dL), and an elevated procalcitonin level (1.34 ng/mL). Chest computed tomography (CT) showed enlargement of the 4 L lymph node with low-attenuation areas (42 mm × 40 mm in size) and an elevated mediastinal fat concentration [Figure 1a]. The patient was diagnosed with mediastinal cyst infection accompanying mediastinitis after EBUS-TBNA, and ampicillin–sulbactam administration (3.0 g every 6 h) was initiated.

On day 2 of admission, blood cultures showed the presence of Gram-positive cocci. On day 3 of admission, the Gram-positive cocci in blood culture were identified as *S. anginosus* using matrix-assisted laser-desorption/ionization time-of-flight mass spectrometry. On day 5 of admission, the fever and his physical condition showed improvement. Treatment with ampicillin–sulbactam was administered for 28 days. Ampicillin–sulbactam was switched to oral amoxicillin–clavulanic acid, and he was discharged from the hospital.

Follow-up chest CT 2 months after starting antimicrobial agents showed that the size of the 4 L

lymph node had decreased to 34 mm × 28 mm, and the mediastinal fat concentration had decreased as well [Figure 1b]. Treatment with amoxicillin–clavulanic acid was administered for 8 weeks, so antimicrobial agents were administered for a total of 12 weeks. However, follow-up chest CT 5 months following the discontinuation of antimicrobial agents revealed enlargement of the 4 L lymph node with low-attenuation areas (48 mm × 36 mm in size) and an elevated mediastinal fat concentration [Figure 1c]. Laboratory tests revealed an elevated C-reactive protein level (4.1 mg/dL), and blood cultures were negative. He was diagnosed with recurrent mediastinal cyst infection, and ampicillin–sulbactam administration was initiated.

Follow-up chest CT at 2 weeks after starting antimicrobial agents showed that the size of the 4 L lymph node had decreased to 35 mm × 36 mm, and the mediastinal fat concentration had decreased as well [Figure 1d]. Ampicillin–sulbactam, which was administered for 28 days, was switched to oral amoxicillin–clavulanic acid. Although the surgical resection of mediastinum cyst was recommended, he has denied our proposal.

Discussion

EBUS-TBNA is widely used because of its usefulness in the diagnosis of enlarged thoracic lymph nodes, such as in metastasis of lung cancer. The most common complications after EBUS-TBNA are minor bleeding, pneumothorax, pneumomediastinum, and mediastinitis. A fever is reported to develop in 20% of cases, resolving in most cases within 24 h.^[2] The rate of bacteremia in 43 patients undergoing EBUS-TBNA, and transient

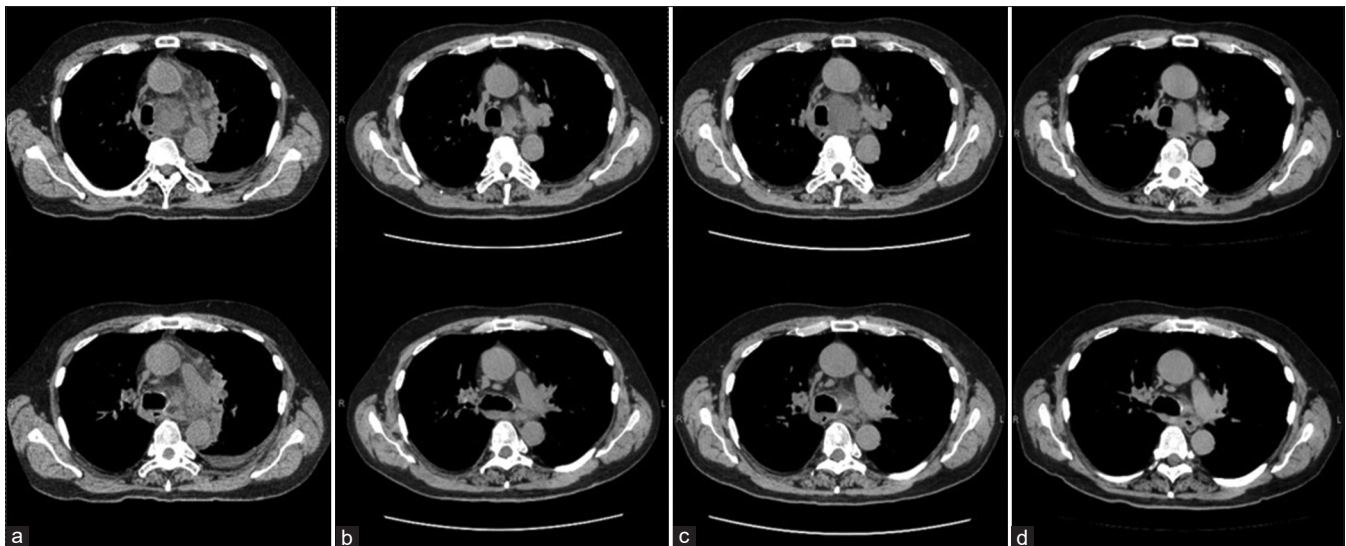


Figure 1: Section of an axial chest computed tomography scan of the 4 L lymph node. (a) Twelve days after endobronchial ultrasound-guide transbronchial needle aspiration. (b) Two months following the start of antimicrobial agents. (c) Five months following the discontinuation of antimicrobial agents. (d) Two weeks after restarting antimicrobial agents

Table 1: Literature review of cases of infective mediastinitis followed by bacteremia after endobronchial ultrasound-guided transbronchial needle aspiration

Author	Age (years)	Sex	Microorganism	Portal of entry	Time from EBUS-TBNA to bacteremia (days)	Treatment	Outcome
Sayan and Arpag	53	Male	<i>Eikenella corrodens</i>	Pericardial empyema	2	Antibiotics (unknown)	Survived
Gautschi et al.	71	Male	<i>Parvimonas micra</i>	Mediastinitis	14	PIPC/TAZ + debridement	Survived
Sanchez-Font et al.	51	Male	<i>Gemella morbillorum</i>	Adenitis	3	AMPC/CVA	Survived
This case	65	Male	<i>Streptococcus anginosus</i>	Mediastinitis	12	ABPC/SBT	Survived

ABPC/SBT=Ampicillin-sulbactam, AMPC/CVA=Amoxicillin-clavulanic acid, PIPC/TAZ=Piperacillin-tazobactam, EBUS-TBNA=Endobronchial ultrasound-guided transbronchial needle aspiration

bacteremia without clinical features were observed in three patients (7%).^[3]

To the best of our knowledge, there have been no reports of recurrent mediastinal cyst infections accompanying mediastinitis followed by bacteremia due to *S. anginosus* after EBUS-TBNA. *S. anginosus* is part of the normal flora of the oral cavity and associated with abscesses forming at various sites on the body. The *S. anginosus* family comprises three species: *S. anginosus*, *Streptococcus constellatus*, and *Staphylococcus intermedius*, and infections caused by these bacteria have marked variability in their clinical presentations. *S. anginosus* is more commonly isolated from the blood, urine, and soft-tissue infections and is less often a cause of abscess formation than the other species; this is consistent with mediastinal cyst infection without abscess formation presenting as a complication after EBUS-TBNA in our case.

To date, only three cases of infective mediastinitis followed by bacteremia after EBUS-TBNA have been reported [Table 1].^[4-6] The cases involved four men and no women. The median duration from EBUS-TBNA to bacteremia was 8 days, and surgery was required in one case. While no treatment guidelines concerning mediastinitis have yet been published, in principle, antibiotic treatment, control of the source of infection, and surgical debridement of the affected tissue are the cornerstones of treatment.^[7] Regarding the reported case series of mediastinitis caused by EBUS-TBNA in patients with benign diseases, all patients required invasive surgery, such as median sternotomy or thoracotomy.^[8] Furthermore, patients with cystic lesions are associated with infectious complications. Cystic lesions are avascular, and an inoculation of bacteria into the cyst leads to local uninhibited bacterial growth due to the inability of the immune system to reach and fight the pathogens there.^[9] Therefore, as in the present case, mediastinal cyst infection accompanying mediastinitis may recur following conservative treatment without invasive surgery, so clinicians should conduct careful follow-up while giving invasive surgery due consideration.

Conclusion

We encountered the first case of mediastinal cyst infection followed by bacteremia caused by *S. anginosus*. Although a transient fever after EBUS-TBNA is common, clinicians should be alert for mediastinal infection as well as bacteremia following EBUS-TBNA in patients who have a prolonged fever.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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