


A case of lung abscess successfully treated by transbronchial drainage using a guide sheath

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Abstract

A 51-year-old man was diagnosed with colon cancer in September 2011, and a solitary pulmonary nodule was detected by computed tomography (CT) scan. We performed a transbronchial biopsy with endobronchial ultrasonography using a guide sheath (GS) and diagnosed lung metastasis of colon cancer. The patient experienced remittent fever after the biopsy in spite of intravenous antibiotic therapies. Moreover, his CT scan showed a large lung abscess at the biopsy site. We performed transbronchial drainage using a GS as salvage therapy. The bloody pus was successfully aspirated, and chest X-ray following the procedure showed dramatic shrinkage of the abscess.

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Introduction

Lung abscess is a subacute infection and is defined as a localized necrosis with accumulation of pus in the pulmonary parenchyma. The most common therapeutic approach to lung abscess is the long-term administration of systemic antibiotics, but 11–21% of patients with lung abscess require surgical lung resection or percutaneous drainage [1]. However, it has been reported that endobronchial drainage may be an effective treatment option for selected patients with refractory lung abscess [2]. Bronchoscopy has been used to diagnose abnormal lung lesions for the past 50 years. The development of new diagnostic tools in recent years, such as endobronchial ultrasonography (EBUS) and guide sheath (GS), has substantially improved diagnostic accuracy [3]. In this report, we describe a case of lung abscess which was complicated by EBUS-GS-transbronchial biopsy (TBB) and was successfully treated with transbronchial drainage using the GS.

Case Report

A 51-year-old man with no medical history was diagnosed with colon cancer in September 2011, and a solitary

pulmonary nodule (left segment 6) was detected by chest X-ray and computed tomography (CT) scan when staging the colon cancer (Fig. 1A, B). We performed a diagnostic bronchoscopy (Olympus BF-260) and took six specimens by EBUS-GS-TBB from the left bronchus 6c (B6c) (Fig. 1C) under conscious sedation using midazolam. The biopsy examination used immunohistochemistry to confirm that the lung nodule was a metastasis of colon cancer. Although the patient did not have any complication or sign of infection immediately after the bronchoscopy, he developed a high fever (above 38.0°C) and cough the night after his discharge from the hospital, and he came to our hospital 6 days after the bronchoscopy. A chest X-ray and a CT scan showed a mass shadow with niveau formation around the known nodule on which we had performed EBUS-GS-TBB (Fig. 1D, E). Elevations in C-reactive protein level and white blood cell count were observed. Therefore, we diagnosed lung abscess associated with EBUS-GS-TBB. We started treatment with oral sitafloxacin (100 mg once per day) and intravenous injection of ampicillin-sulbactam (3.0 g once per day) as empiric therapy without evidence from bacterial culture. In spite of combined antibiotic therapy, the patient's symptoms did not improve.

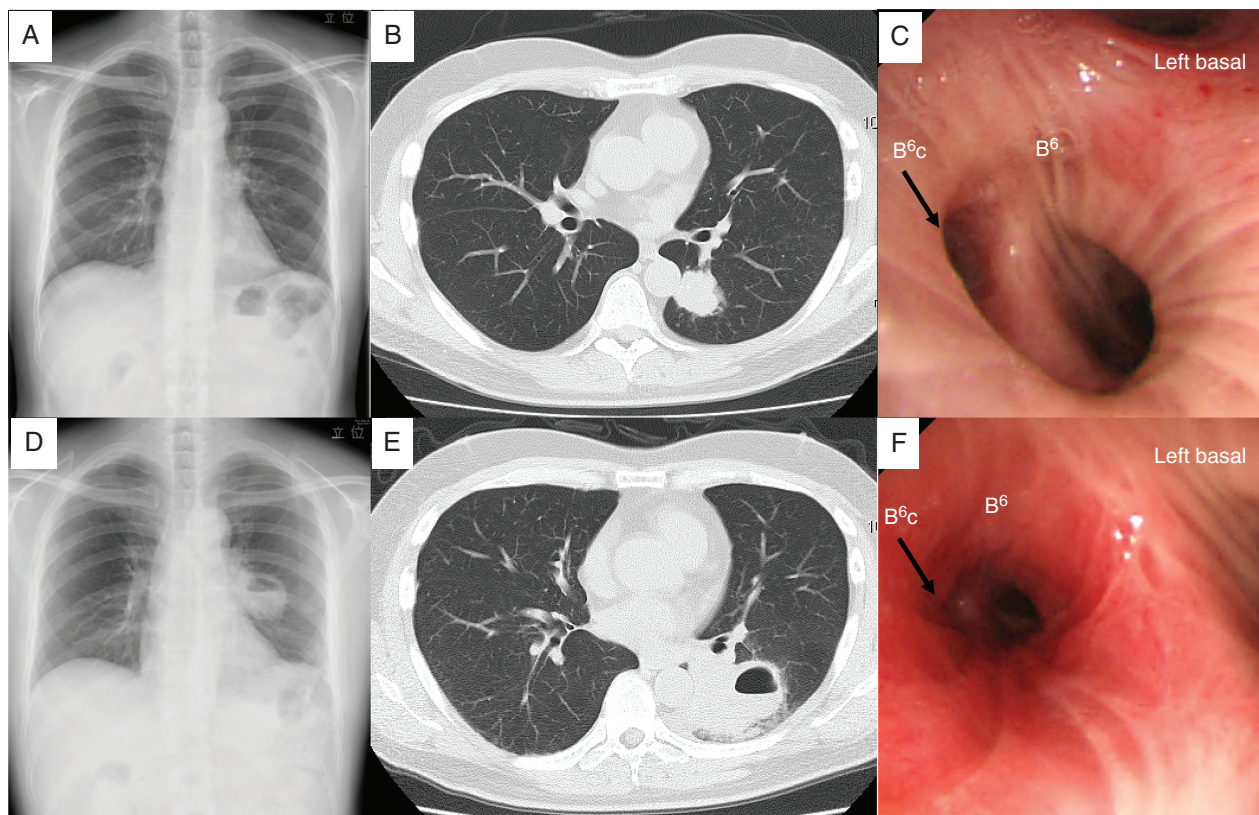


Figure 1. (A) Chest X-ray and (B) chest computed tomography (CT) demonstrated a nodule in the left lung at first visit. (C) Transbronchial biopsy (TBB) was performed from the left bronchus 6c (B6c). (D) Chest X-ray and (E) CT showed a nodular shadow with niveau formation around the known nodule after the transbronchial biopsy. (F) Second bronchoscopy showed that the mucosa of left B6c orifice was reddish and swelling, which resulted in severe bronchial stenosis.

The patient was admitted to our hospital 9 days after the bronchoscopy, and we performed escalation therapy with intravenous injection of doripenem (0.5 g thrice a day). Although the fever lessened slightly after treatment with doripenem, the lung abscess was greatly enlarged when viewed with chest X-ray and CT scan on the eighth hospital day. Because of poor responsiveness to antibiotic therapy, on the 11th hospital day we performed another bronchoscopy to drain the abscess and to identify the cause of infection. Bronchoscopy showed that the mucosa of left B6c orifice was reddish and swollen, which resulted in severe bronchial stenosis (Fig. 1F). Because we could not aspirate the pus with suction directly, we attempted to perform drainage using GS, which is typically used to introduce forceps and brushes into the target bronchus. The GS (Olympus SG-201C) was inserted into the left B6c through the channel of bronchoscope (BF-1T260) (Fig. 2A). A total of 30 mL of bloody pus was obtained when aspirating manually with a 20-mL syringe through the GS (Fig. 2B), and a chest X-ray just after the procedure showed a dramatic shrinkage of the abscess (Fig. 2C). After

the one-time drainage, the patient's body temperature quickly decreased to 37°C. Because penicillin-sensitive β -streptococcus species was detected in the aspirate culture, the patient underwent de-escalation from doripenem to oral amoxicillin-clavulanate potassium (250 mg thrice a day). The abscess disappeared after 4 weeks of antibiotic therapy and without any invasive procedure.

Discussion

Bronchoscopy is a common and effective method for the diagnosis of lung lesions. The most frequent complications of bronchoscopy are haemorrhage, pneumothorax, and infection. The risk of infection includes infection with pneumonia, although incidence is less than 1% [4]. There have been few reports of lung abscess arising as a complication of EBUS-GS-TBB [5].

In this case, antibiotic therapies, including penicillin, new quinolone, and carbapenem, were administered empirically and were unsuccessful. However, the abscess dramatically reduced upon one-time drainage using

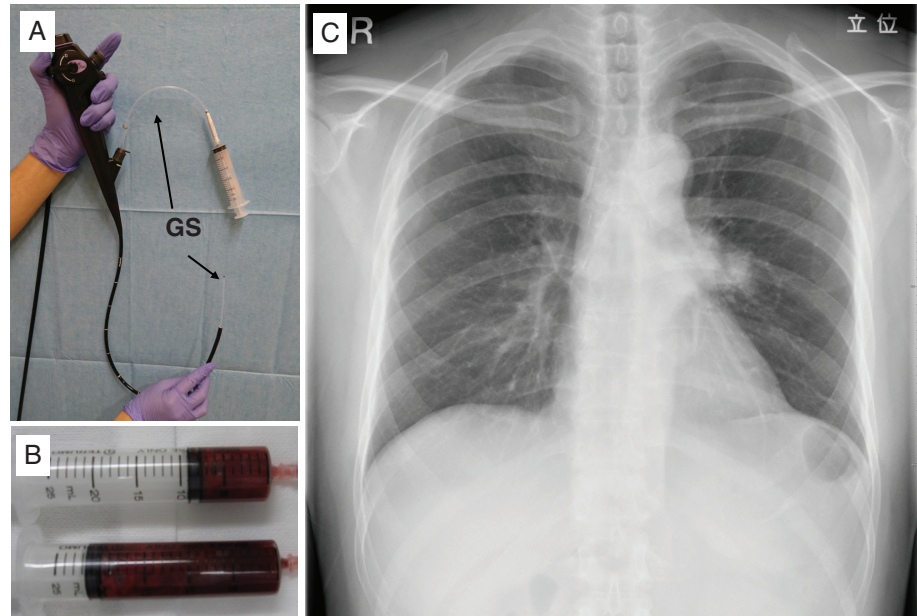


Figure 2. (A) An illustration of bronchoscopic drainage using guide sheath (GS). The type of flexible bronchoscope was BF-1T260 (Olympus, Japan), and the GS was SG-201C (Olympus, Japan) for use in scope with 2.6-mm working channel. One-time drainage was performed through the GS without fluoroscopy and endobronchial ultrasonography (EBUS) guidance. (B) The bloody pus obtained by the procedure. (C) Chest X-ray just after the bronchoscopic drainage showed dramatic shrinkage of the lung abscess.

GS. This result suggests the importance of drainage in the treatment of lung abscess. As an alternative approach to percutaneous drainage or lung resection in patients refractory to antibiotic therapy, endoscopic continuous drainage has been reported to be safe and effective if there is an airway present that leads to the abscess [2].

In this case, we selected bronchoscopic drainage as a treatment method because the abscess was associated with a bronchoscopic biopsy, and the bronchus was therefore expected to have a connection to the abscess. As a result, the bronchoscopic drainage using GS contributed to the cure of the lung abscess as well as to the identification of the causative bacteria without any complication. The one-time drainage using GS is far less invasive than surgical resection, percutaneous drainage, or continuous endoscopic drainage. We believe that bronchoscopic drainage using GS is an effective alternative strategy for the treatment of lung abscess in patients who have an airway connection to the abscess.

In summary, we report the first successful case of transbronchial drainage using GS for lung abscess complicated by EBUS-GS-TBB. This transbronchial drainage procedure using GS may be an effective and safe strategy in the treatment of lung abscess with airway connection in patients who are refractory to antibiotic therapy.

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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