



## Tracheomediastinal Fistulae: A Rare Complication of Endobronchial Ultrasound Guided Transbronchial Needle Aspiration for Lung Cancer Diagnosis

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### Abstract

**Introduction:** Tracheal or bronchial fistulae seem to be a very rare complication only reported in a few cases.

**Case Report:** We report the case of a 68-year-old woman with poorly differentiated lung adenocarcinoma diagnosed by bronchoscopy with EBUS-TBNA of the 4R mediastinal station under local anesthesia. Because of a major mass effect on the superior cava vein by mediastinal adenopathies compression, the patient undergoes urgent decompressive radiotherapy (Total delivered dose = 45 Gy in 15 sessions). Adjuvant chemotherapy is planned. Before the initiation of chemotherapy, a few days after the end of radiotherapy, the patient presents with cough, purulent sputum and fever. A thoracic CT scan shows pulmonary infiltrates suggestive of acute community-acquired pneumonia. In addition, there is evidence of bronchomediastinal fistula in front of mediastinal 4R station and located at the site of TBNA but without any clinical or radiological element suggestive of acute mediastinitis. At this time a control bronchoscopy confirms the presence of BMF.

**Conclusion:** BMF is a rare complication with few reported cases. Yet this complication could be underreported. Favoring risk factors of BMF are not well known. If an association with *bevacizumab* treatment and intratumoral injection of cisplatin has already been described, this is to our knowledge, the first published case of a BMF occurring after radiotherapy.

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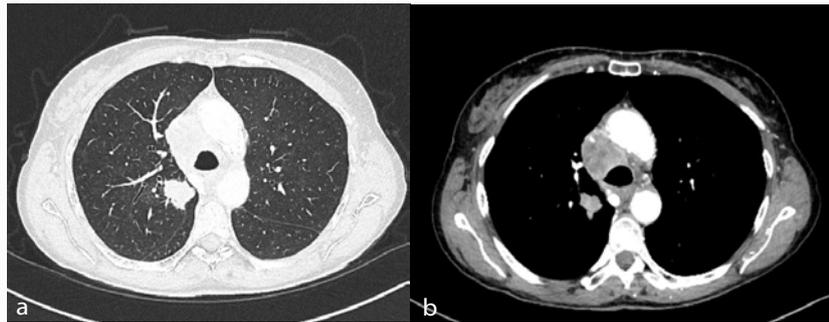
### Introduction

Real time endobronchial ultrasound with guided transbronchial needle aspiration (EBUS-TBNA) is a bronchoscopic technique using a miniaturized convex ultrasound probe at the tip of a flexible bronchoscope to accurately localize and sample structures of interest from the lung and mediastinum (lung or mediastinal tumor, hilar and mediastinal lymph nodes). This technique is particularly efficient in providing the diagnosis of neoplasia, infectious diseases and inflammatory disease presenting with enlarged mediastinal lymph nodes. The ultrasound also localizes pleura and vascular structures reducing the risk of complications such as pneumothorax and bleeding.

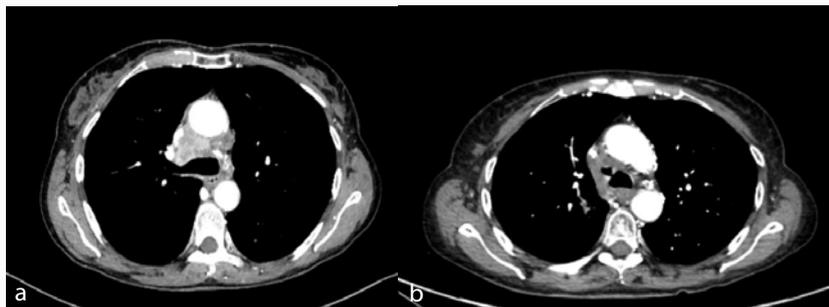
In a meta-analysis, Varela-Lema et al. [1] showed that EBUS-TBNA has a sensitivity range of 85-100% in visualising and staging lymph nodes from patients with suspected or established lung cancer and a 88-93% yield for the diagnosis of sarcoidosis[1]. In addition to its high diagnostic yield, EBUS-TBNA is a safe technique. In the same meta-analysis, on a total of 1782 patients from 18 studies, no major complication related to the procedure was reported. In another meta-analysis from Holty et al. [2] the overall major complication rate was 0.26% (95% CI 0.01 to 4). The more frequent reported complications were major bleeding (2 patients), pneumothorax (3 patients with one requiring a chest tube), pneumomediastinum (1 patient) [2]. Tracheal or bronchial fistulae seem to be a very rare complication only reported in few cases. Recently Wong et al. [3] published the case of a bronchomediastinal fistula that occurred in the context of bevacizumab treatment. Few case reports have already been published in the literature on the association between bronchomediastinal fistula and cancer itself or chemotherapy (particularly bevacizumab) with or without radiation [4-6].

### Case Presentation

We report the case of a 68-year-old woman who presents a two day history of facial edema, upper thoracic and neck veins distension. The initial workup consisting of a chest CT-scan shows an upper lobe (27x21mm) intraparenchymal mass with heterogeneous mediastinal adenopathies that have a



**Figure 1:** CT scan at admission. The chest CT-scan shows an upper lobe (27x21mm) intraparenchymal mass with heterogeneous mediastinal adenopathies that have a necrotic aspect in the 4R area.



**Figure 2:** Control CT realised during the workup of the presumed infectious complication, showing a bronchomediastinal fistula in b panel.



**Figure 3:** Control bronchoscopy confirms the presence of the tracheomediastinal fistula.

necrotic aspect in the 4R area. Those adenopathies are responsible for a major mass effect on the superior cava vein (Figure 1 a and b). The patient undergoes a diagnostic bronchoscopy with EBUS-TBNA of the 4R region under local anesthesia, without immediate complication. Cytology analysis confirms poorly differentiated lung adenocarcinoma stage IIIIB (cT4N2M0) according to 8<sup>th</sup> TNM edition.

The patient undergoes urgent decompressive mediastinal radiotherapy (total delivered dose = 45 Gy in 15 sessions) to treat the superior vena cava syndrome and adjuvant chemotherapy is planned. Before the initiation of chemotherapy, a few days after the end of radiotherapy, the patient presents with cough, purulent sputum and fever. White blood cell count (6.2 G/L) and C-reactive protein (<5mg/L) are normal at admission but a thoracic CT scan shows pulmonary infiltrates compatible with acute community acquired pneumonia, consistent with the clinical presentation. In addition, CT scan (Figure 2 a and b) reveals a tracheomediastinal fistula in front of 4R station and located at the site of TBNA without clinical or radiological element suggestive of acute mediastinitis.

At this time a control bronchoscopy confirms the presence of the tracheomediastinal fistula (Figure 3).

The patient receives broad-spectrum antibiotics (Piperacillin-Tazobactam) for the treatment of community acquired pneumonia and chemotherapy is delayed. During the follow up, the patient do not develop any clinical or radiological signs of mediastinitis at any time and pneumonia resolves under antibiotic regimen.

## Discussion

A tracheomediastinal fistula is a rare complication of EBUS-TBNA with few reported cases [4-6]. To our knowledge, we report the first patient with such a complication that did not receive intra-mediastinal chemotherapy injection or a monoclonal antibody directed against endothelial vascular growth factor (bevacizumab). Yet, this complication may be underreported as it could be asymptomatic in most cases and control CT scan is generally not mandatory in the immediate follow up of bronchoscopy. We assume that this complication is incidentally discovered in our patient in

the work up of acute pneumonia. In 2015, Metha et al. [7] reported a case series of 36 patients in which they treated 50 sites of isolated mediastinal and hilar recurrence of lung cancer with endobronchial ultrasound guided intratumoral injection of cisplatin during a bronchoscopy. Two patients developed bronchomediastinal fistula. In these cases, fistula contributed to increased morbidity but did not lead to additional hospitalizations or increased mortality [7]. Finally this case is highlighting radiotherapy as a hypothetical contributing factor of bronchomediastinal fistula. In the present case the fact that the adenopathy was necrotic on the CT scan before the TBNA could be another factor favoring bronchomediastinal fistula development.

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