Bronchial Fistula and Pneumomediastinum after EBUS-TBNA Following Mediastinoscopy

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Abstract

Keywords ➤ mediastinum (incl. mediastinoscopy)
➤ thoracic surgery
➤ mediastinal lymph nodes
➤ ultrasound (all applications)

Background Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is a very useful diagnostic tool for the assessment of enlarged mediastinal and hilar lymph nodes. It is a safe procedure with a low risk of complications.

Case Description We report a case of bronchial fistula and pneumomediastinum after EBUS-TBNA, which was performed shortly after a mediastinoscopy. Due to the extent of the bronchial lesion, a surgical closure of the bronchial fistula was necessary. The patient recovered completely.

Conclusion The performance of EBUS-TBNA shortly after a mediastinoscopy should not be recommended to avoid possible procedure-related complications.

Introduction

Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is a widely used diagnostic tool for the assessment of enlarged mediastinal and hilar lymph nodes and therefore plays a substantial role in the staging of lung cancer.1 It is a noninvasive and safe technique with a low risk of complications, most of which are relatively harmless, such as cough, agitation, or bleeding at the puncture site.2 However, cases of more serious procedure-related events have been sporadically reported in the literature.3 4

Case Description

This is a report of a 56-year-old female patient who was admitted at our institution for the clarification of diffuse interstitial infiltrations of the lower lung lobes and hilar and mediastinal lymphadenopathy. A malignancy, in particular a non-Hodgkin lymphoma, was initially suspected and a mediastinoscopy was primarily performed to gain a sufficient amount of material. A bleeding which occurred during this procedure was handled with local compression with a gauge and minimal use of local electrocautery. The procedure was concluded with sampling of the enlarged lymph nodes at the right inferior paratracheal level without complete resection.

Radiological control on the first postoperative day excluded hematoma formation or pneumomediastinum and the patient was discharged on the next day. The pathological examination of the specimens showed a histiocytic lymphadenitis. Due to the discrepancy between clinical evaluation and pathological findings, an EBUS-TBNA was performed 2 weeks after the mediastinoscopy. Probes were attained from lymph nodes at stations 4L, 4R, 11L, 7 as well as from the right main bronchus.

One week later the patient was readmitted to the hospital due to fever and fatigue. The mediastinoscopy wound was lightly reddened and a small amount of serous fluid was easily evacuated after applying slight pressure on the wound. A computed tomography scan of the thorax was suspicious of a bronchomediastinal fistula depicting a pneumomediastinum (► Figs. 1 and 2), whereas a bronchoscopy confirmed the fistula showing a melting lesion on the right main bronchus (► Fig. 3).

The patient was then subjected to a right axillary thoracotomy; the pretracheal area until the tracheal bifurcation was partially loose but did not have any sign of an extended infection. Microbiological specimens from the site of the paratracheal tissue obtained during the surgical revision were negative. Specimens taken from the lesion site during the preoperative bronchoscopy were positive for Staphylococcus.
The fistula with a size of a baby fingertip was located on the right main bronchus. A local debridement was done and the bronchial defect was directly closed with 4–0 PDS sutures and covered with the mobilized azygous vein. An extended biopsy of the enlarged lymph nodes was also performed. The patient was treated with antibiotics postoperatively. Postoperative bronchoscopy revealed a firm closure of the lesion (►Fig. 4). The mediastinoscopy wound healed easily without any further surgical measures.

The patient recovered completely and was discharged 1 week later. Histology of the abundant specimens excluded again malignancy, showing anthracotic and histiocytic-altered lymphatic tissue, as well as an extended active perilymphadenitis matching to the local bronchomediastinal fistula.

**Comment**

In our case, the local tumor board decided for a biopsy of the enlarged mediastinal lymph nodes via mediastinoscopy, as its location was ideal to reach with the conventional mediastinoscope and due to the suspicion of a lymphoma. In cases of lymphoma, abundant tissue sampling is of paramount importance. Farmer et al have already indicated that the reliability of
diagnosing of lymphoma based on small samples is significantly influenced by the various subtypes.\(^5\) Though EBUS-TBNA offers tissue sampling with minimal trauma, mediastinoscopy has a higher diagnostic accuracy and can be recommended for patients with mediastinal lymphadenopathy or mediastinal mass as first choice diagnostic tool.\(^6\)

A bleeding that occurred during the mediastinoscopy was handled by local compression without excessive use of electrocautery. Furthermore, only sampling of the lymph nodes was performed. The pretracheal space was completely filled with air which drained off through the collar incision and a fistula from the bronchus through the mediastinum could be established. In any other case, the firmness of the surrounding tissues would probably prevent the formation of a fistula after a similar bronchial lesion.

The bleeding that occurred by the time of the mediastinoscopy was located on the anterior surface of the tracheal bifurcation most probably from a bronchial artery crossing the trachea from the left to the right. Although this bleeding was managed with compression and limited electrocautery, it could have played a role in the later occurrence of the fistula due to a local ischemia of the external bronchial wall. This in combination with a biopsy from the region 2 weeks later could have been the causative mechanism for the emergence of the fistula. Nevertheless, the lesion could be directly closed unproblematically.

In conclusion, although the need of an EBUS-TBNA after a mediastinoscopy is rather unlikely, this should not be performed shortly after the mediastinoscopy, to avoid possible procedure–related local complications, necessitating more invasive treatment.

Conflict of Interest
None declared.

References