**Case
Report**

An Unusual Complication of Endobronchial Ultrasound-Guided Transbronchial Needle Aspiration (EBUS-TBNA): the Needle Breakage

M. Akif Özgül, MD,¹ Erdoğan Çetinkaya, MD,¹ Nuri Tutar, MD,² and Güler Özgül, MD¹

Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is now becoming a widely accepted procedure to investigate the mediastinum for the staging of non-small-cell lung cancer and diagnosing mediastinal lesions. During the intervention, some minor or major complications may occasionally occur. The present case report describes the first reported case of needle breakage during EBUS-TBNA.

Keywords: endobronchial ultrasonography, transbronchial needle aspiration

Introduction

Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is now becoming a widely accepted procedure to investigate the mediastinum for the staging of non-small-cell lung cancer and for diagnosing mediastinal lesions accessible via the major airway.^{1,2} It is a non-invasive technique with minor complications of agitation, cough, and presence of blood at the puncture site.³ Mediastinal abscess, empyema, and lung abscess are major complications that have been reported in recent years, in the form of case reports.^{1,4,5} The present study describes the first reported case of needle breakage during EBUS-TBNA.

¹Department of Pulmonary Medicine, Yedikule Chest Disease and Surgery Training and Research Hospital, Istanbul, Turkey

²Department of Pulmonary Medicine, Erciyes University School of Medicine, Kayseri, Turkey

Received: April 19, 2012; Accepted: December 19, 2012

Corresponding author: Nuri Tutar, MD. Department of Pulmonary Medicine, Erciyes University School of Medicine, Kayseri, 38038, Turkey

Email: drnuritutar@gmail.com

©2014 The Editorial Committee of *Annals of Thoracic and Cardiovascular Surgery*. All rights reserved.

Case Report

A 62-year-old man was admitted to Yedikule Chest Disease and Surgery Training and Research Hospital (Istanbul, Turkey) in January 2012. The patient was referred to our hospital because of mediastinal widening on the chest X-ray. There were no respiratory system symptoms, and the chest radiograph was obtained for the preoperative evaluation of inguinal hernia. On admission, there were no positive findings in the physical examination except for a bilateral inguinal hernia. The chest computed tomography (CT) showed enlarged right paratracheal and subcarinal lymph nodes (**Fig. 1**). The patient underwent endobronchial ultrasonography (CP-EBUS; BF-UC 160F-OL8; Olympus Medical Systems, Tokyo, Japan) with a 22-gauge aspirating needle with syringe model NA-201SX-4022 (Olympus, Japan). The needle was new and used for the first time. Two uneventful transbronchial aspirates were taken from the midline of the subcarinal lymph node without kinking or bending of the needle. The needle was inserted near the midline of the same lymph node for the third time, and it was moved back and forth smoothly. While the third forth movement was being performed, the bronchoscopist felt that the needle was broken because the

Fig. 1 Contrast-enhanced CT-scan of the chest showing an enlarged subcarinal lymph node.

needle tip was not seen on the ultrasonography monitor. The needle was then withdrawn, and the tip was found in the bronchial system, seen on the EBUS bronchoscope monitor. After the EBUS had been removed, it was observed that 11 mm of the needle was broken (**Fig. 2**). Immediately after, a flexible bronchoscopy was performed expeditiously, but the needle was not found in the bronchial system. An abdominal X-ray was performed with the patient in a standing position, approximately three hours after the procedure. This showed normal amounts of gas and stool distribution, and the needle tip was seen in the left upper side of the abdomen in the transverse colon (**Fig. 3a and 3b**). The needle tip was probably expelled from the bronchial system and trachea by endobronchial ultrasonography contact or coughing, and it entered the gastrointestinal tract by swallowing. There were no complications in the patient's follow-up. It was probably defecated in the feces.

Discussion

As a group, we now have completed over 1000 EBUS and transbronchial aspirates without additional, serious complications. Bending of the needle is sometimes seen in aspirating 'hard' lymph nodes; however, we had not seen any cases of needle breakage in our clinic or in the literature.

An EBUS-TBNA aspiration needle has a working length of 700 mm, a maximum needle length of 40 mm and is either 22 or 21 gauge. The surface of the needle tip has a dimpled echogenic design to improve visibility on ultrasound images. In the present case, an 11-mm piece, including the dimpled side of the 22-gauge needle, was

Fig. 2 Normal image of the needle and broken needle.

broken. When we examined the needle, the tip of the broken side appeared to have minimally narrowed. Interestingly, the lymph node was not hard in the present case, and after two uneventful transbronchial aspirates had been taken, it did not kink or bend. We believe that while the third transbronchial aspirate was being taken, the needle might have become kinked and then broke. Perhaps, this could have been due to a fault in the production of the needle because the broken side was very close to the dimpled area. While the dimpled area was constructed, this part probably might have become thinned or damaged. Fortunately, it did not break in the lymph node. If the needle had broken in the lymph node, a thoracotomy would have been required to remove it. In the present report, the needle passed through to the gastrointestinal tract probably as a result of coughing or endobronchial ultrasonography contact and then swallowing. An abdominal X-ray was performed approximately three hours after the procedure, so the needle tip was seen in the transverse colon at that time. It was probably defecated in the feces because there were no complications in the follow up. Therefore, the occurrence of serious complications was prevented.

EBUS-TBNA is a safe and minimally invasive procedure, and it does not require general anesthesia or hospitalization. Varela-Lema, et al. published a review and noted no important complications in over 1500 completed EBUS-TBNA procedures.³⁾ In this review, minor complications were agitation, cough, and presence of blood at the puncture site.

In recent years, there have been some case reports about EBUS-TBNA with major complications. Haas reported two infectious complications from EBUS-TBNA.⁶⁾ One was a pericardial effusion that was positive

Fig. 3 (a–b) Abdominal X-ray showing radiopacity due to the needle in the left upper zone.

for *Actinomyces odontolyticus* and *Streptococcus mutans* and the second was a lung abscess. Both complications were treated adequately with antibiotics. Mediastinal abscess is another serious complication that has been reported.⁴⁾ A very recent case report showed empyema, lung abscess, and mediastinal abscess that developed in a patient undergoing EBUS-TBNA; the patient subsequently recovered uneventfully after aggressive surgical debridement and antimicrobial therapy.¹⁾ Gupta, et al. reported an endobronchial inflammatory polyp as a complication after EBUS-TBNA in a patient with tuberculous lymphadenitis.⁷⁾ These case reports are the only serious complications reported in EBUS-TBNA.

In conclusion, infections following EBUS-TBNA interventions have been seen as serious complications. However, this is the first report about a broken needle, which may have resulted in more harmful consequences, during EBUS-TBNA. This case report shows that needle breakage should be kept in mind, and the bronchoscopist should be extremely careful during the intervention.

Disclosure Statement

There is no conflict of interest regarding this manuscript, endobronchial ultrasonography or needle.

References

- 1) Huang CT, Chen CY, Ho CC, et al. A rare constellation of empyema, lung abscess, and mediastinal abscess as a complication of endobronchial ultrasound-guided transbronchial needle aspiration. *Eur J Cardiothorac Surg* 2011; **40**: 264-5.
- 2) Cetinkaya E, Gunluoglu G, Ozgul A, et al. Value of real-time endobronchial ultrasound-guided transbronchial needle aspiration. *Ann Thorac Med* 2011; **6**: 77-81.
- 3) Varela-Lema L, Fernández-Villar A, Ruano-Ravina A. Effectiveness and safety of endobronchial ultrasound-transbronchial needle aspiration: a systematic review. *Eur Respir J* 2009; **33**: 1156-64.
- 4) Moffatt-Bruce SD, Ross P. Mediastinal abscess after endobronchial ultrasound with transbronchial needle aspiration: a case report. *J Cardiothorac Surg* 2010; **5**: 33.
- 5) Parker KL, Bizakis CS, Zervos MD. Severe mediastinal infection with abscess formation after endobronchial ultrasound-guided transbronchial needle aspiration. *Ann Thorac Surg* 2010; **89**: 1271-2.
- 6) Haas AR. Infectious complications from full extension endobronchial ultrasound transbronchial needle aspiration. *Eur Respir J* 2009; **33**: 935-8.
- 7) Gupta R, Park HY, Kim H, et al. Endobronchial inflammatory polyp as a rare complication of endobronchial ultrasound-transbronchial needle aspiration. *Interact Cardiovasc Thorac Surg* 2010; **11**: 340-1.