

CASE REPORT

Mucosal airway laceration secondary to endobronchial ultrasonography

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Endobronchial ultrasound-guided transbronchial needle aspiration is becoming the standard of care for mediastinal sampling to diagnose and stage lung cancer. It is considered to be safe and rivals the gold standard, mediastinoscopy, in safety and accuracy. The present article describes a mucosal airway laceration and pneumothorax associated with the procedure.

Key Words: Bronchoscopy; Complications; Endobronchial ultrasound; Lung cancer

Endobronchial ultrasound (EBUS) guidance has become routine in the performance of transbronchial needle aspiration (TBNA) (1,2). The procedure allows for more precise targeting of lesions, while minimizing potential complications (3). The procedure is generally regarded to be extremely safe; however, the unique scope design may be associated with complications. We present a case of an airway laceration, underscoring important aspects regarding the safety of this technique.

CASE PRESENTATION

An 81-year-old woman presented to the Carilion Clinic (Virginia, USA) with a right upper lobe (RUL) mass and mediastinal adenopathy seen on chest computed tomography. For staging, EBUS-guided TBNA of station 4R was performed. An Olympus BF-UC180F ultrasound bronchoscope (Olympus America, USA) was used, under general anesthesia, through a laryngeal mask airway. Six aspirate samples were obtained

Une lésion des muqueuses respiratoires causée par une échographie endobronchique

L'aspiration transbronchique à l'aiguille par échographie endobronchique est en voie de devenir la norme pour les prélèvements du médiastin visant à diagnostiquer et à évaluer le stade du cancer du poumon. Elle est considérée comme sécuritaire, sans compter que sa sécurité et sa précision rivalisent avec la médiastinoscopie, la norme d'excellence. Le présent article décrit une lésion des muqueuses respiratoires et un pneumothorax découlant de l'intervention.

using a 21-gauge ViziShot NA-201SX-4021 needle (Olympus America, USA). While awaiting rapid onsite cytological examination, the EBUS scope was advanced to inspect the RUL. On retraction of the EBUS scope, a mucosal tear was noted. The EBUS scope was removed. Inspection of the airways using a smaller diagnostic scope (Olympus BF-Q 180) confirmed the presence of a 10 mm long mucosal laceration along the lateral wall of the RUL entry. The depth of the laceration was estimated to be 2 mm to 3 mm, thus also involving the submucosa (Figure 1). The RUL was sampled with a Cellebrity M00516010 cytology brush (Boston Scientific, USA). A postprocedure chest roentogram demonstrated a pneumothorax (Figure 2), which was successfully managed with a chest tube. The pathology of the TBNA was adenocarcinoma. Further imaging revealed metastatic disease. Given her poor functional status, the patient and her family opted for hospice care. She passed away peacefully in the hospice unit.

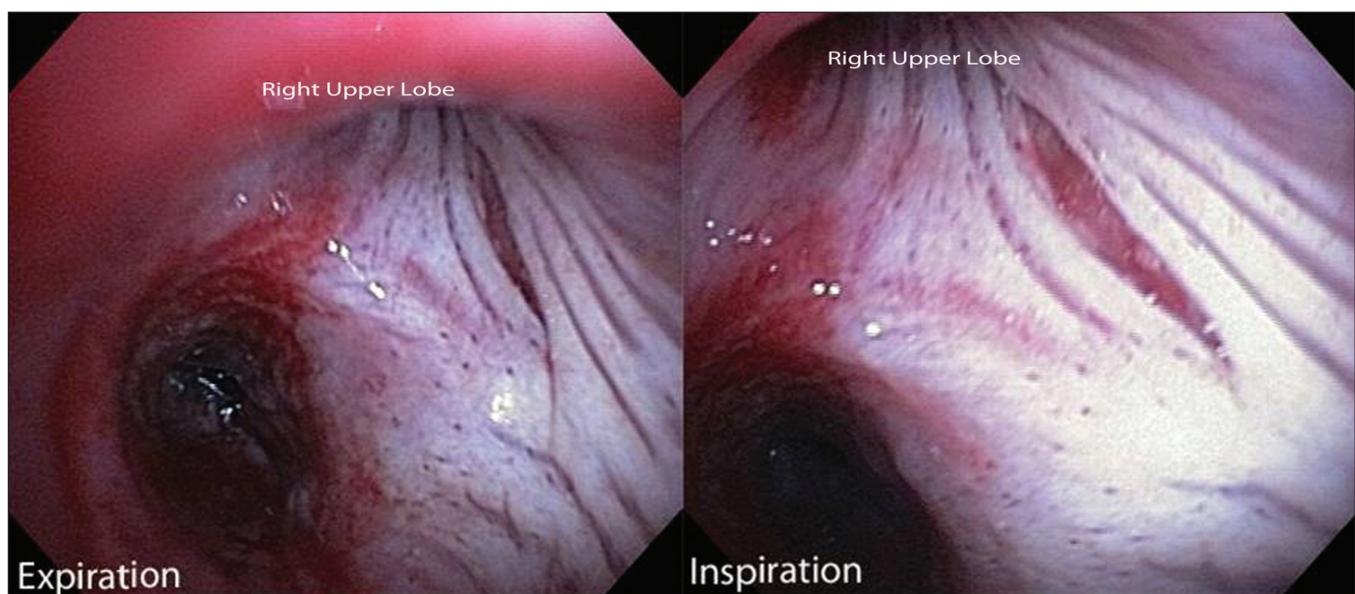


Figure 1) Mucosal laceration following endobronchial ultrasound (expiration and inspiration)

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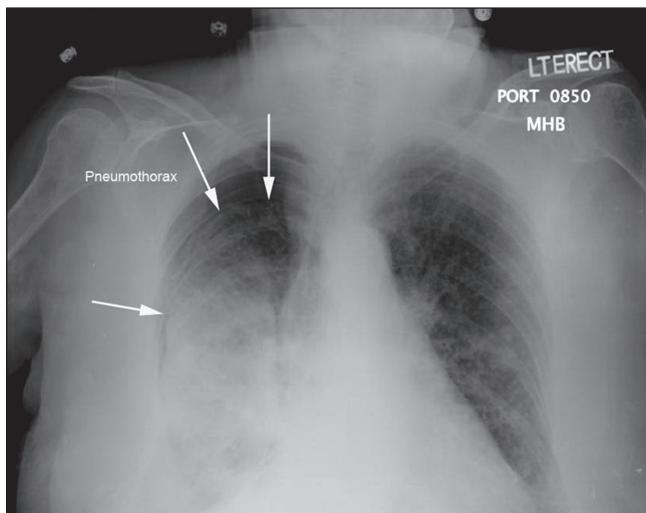


Figure 2) Pneumothorax (arrows) following endobronchial ultrasound and mucosal laceration

DISCUSSION

EBUS, while relatively new, is rapidly being adopted by many centres in the United States because it is a minimally invasive procedure as opposed to the gold standard, mediastinoscopy. EBUS is generally considered to be safe but, as with any new technology, it is conceivable that complications may be recognized as the technology becomes more widely used (1-3). Because there is currently no standardized training for EBUS, novice or inexperienced bronchoscopists using this new technology may encounter a higher number of complications than previously reported.

Yasufuku (3) reported a large series of EBUS procedures with no complications. Meta-analyses suggest that only minimal complications should be expected, namely agitation, cough and bleeding at the puncture site (1,2). Isolated complications have been reported to include transient bacteremia, lung and mediastinal abscesses, metallic particles embedded in the lymph nodes, and inflammatory polyps or granulation tissue at the aspiration site (5-9), none of which appear to be related to the use of EBUS, but rather to the performance of TBNA.

The performance of EBUS may, nevertheless, have specific related concerns. Recently, an airway laceration after EBUS performance, presumably related specifically to the use of this instrument, was reported (10). In general, when using the EBUS scope, procedures can take longer, therefore increasing patient exposure to anesthesia and sedation, thus putting patients at potentially added anesthesia-related risk.

The design of the EBUS scope is physically different from traditional bronchoscopes. It is not only larger, but has a rigid tip with a chisel-like shape and incorporates the ultrasound sensor. The camera is at 30° to the long axis of the scope, thus making navigation different. To obtain a centralized view of the airway, the scope must be retroflexed, exposing the sharp edge of the 'chisel' toward the airway wall. Such

retroflexion should be avoided while navigating because it may cause airway trauma. Given these inherent design properties, the EBUS scope is not an adequate instrument for airway inspections.

Our patient's pneumothorax, while possibly related to the brush procedure, was likely related to the airway laceration. In fact, the laceration can be explained to be the direct result of trauma caused by the EBUS scope.

CONCLUSION

We suspect that there may be under-reporting of complications, and believe it is important to report these cases to alert physicians of the potential pitfalls of this new procedure. We also encourage physicians to avoid inspecting the airways with an EBUS scope, and encourage manufacturers to continue improving the design of these novel instruments. We also recommend that this procedure be performed either personally or directly supervised by an experienced bronchoscopist.

IN MEMORIUM: This article is dedicated to the memory of Dr Amarinder Sandhu, a wonderful family man whose colleagues will remember him as a brilliant physician, student and teacher.

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