pulmonary fibrosis: a proof of concept study. *Pulm Pharmacol Ther* 2014;29:233–240.

Check for updates

Ultrasound-guided Transthoracic Needle Aspiration to Diagnose Invasive Pulmonary Aspergillosis

To the Editor:

We read with interest the recent American Thoracic Society guideline regarding microbiological laboratory testing in the diagnosis of fungal infections in pulmonary and critical care practice (1). According to this guideline, if the results of serum and BAL galactomannan testing are both negative but invasive pulmonary aspergillosis (IPA) is still suspected, biopsy with histopathology and culture is suggested. Given the invasive nature of biopsy and the necessity of transportation for computed tomography–guided procedures, ultrasound-guided transthoracic needle aspiration (TTNA) may be a feasible alternative choice for making a definite mycologic diagnosis, especially in the ICU setting. Herein, we report a patient with IPA whose diagnosis was established only after ultrasound-guided TTNA.

A 79-year-old man with underlying diseases of old stroke with dementia, chronic kidney disease, and newly diagnosed systemic lupus erythematosus was admitted to the ICU after intubation for presumed community-acquired pneumonia with acute respiratory failure. Computed tomography of the chest showed consolidation in the left upper lobe with abscess formation (Figure 1A). Cultures of blood, tracheal aspirate, and BAL fluid revealed no evidence of bacteria, fungus, or *Mycobacterium* infection. The galactomannan level in serum and BAL fluid was 0.13 and 0.51, respectively. A bedside lung ultrasound showed areas of tissue-like consolidation with linear air bronchograms (Figure 1B), and ultrasound-guided TTNA was performed. The culture of lung aspirate yielded *Aspergillus* and *Cladosporium* species 5 days later and intravenous voriconazole was administered for the diagnosis of proven invasive fungal pneumonia. He was extubated on postintubation Day 10 and discharged 1 1/2 months later to a long-term care facility with dependence on noninvasive ventilation.

Microbiological laboratory testing has been proposed as an aid in the diagnosis of IPA (1), but the lack of culture evidence and the category of "probable" disease are the main diagnostic limitations. Although semiquantitative *Aspergillus*-positive culture of BAL fluid were included in a clinical algorithm of "putative" IPA (2), the sensitivity is only 20–50%, as in the depicted case (3). Ultrasound-guided transthoracic procedures have less frequent iatrogenic complications than computed tomography–guided procedures, probably as a result of real-time visualization of vasculatures and air bronchograms, and can be performed by interventional pulmonologists in ICUs without the need for patient transportation (4). Ultrasound-guided TTNA has been shown to have a high microbiological yield and low complication rates for the diagnosis of pneumonia in both adults and children (4). To our knowledge, this is the first study to report the use of ultrasound-guided TTNA to diagnose IPA in a patient under mechanical ventilation in the ICU setting. The major limitation of ultrasound-guided TTNA is the need to ensure contact of the pulmonary lesion with the pleural surface to make the "ultrasound window" amenable to intervention. Fortunately, the most common abnormal radiological features of IPA in critically ill patients are infiltrates and consolidation (2), which may have a higher probability to be pleural based than traditional features such as the halo sign or air crescent sign in severely immunocompromised patients. Ultrasound-guided TTNA may be a feasible and safe alternative diagnostic method to establish a "proven" diagnosis of IPA and/or other invasive fungal pneumonia from a sterile pulmonary aspirate. ■
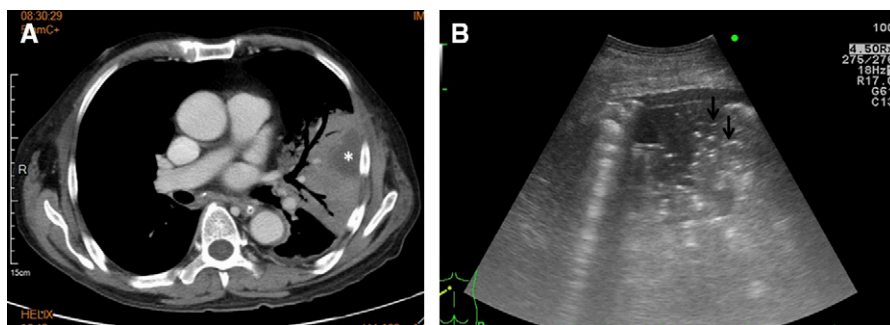

Figure 1. (*A*) Computed tomography of the chest showing consolidation in the left upper lobe with abscess formation (asterisk). (*B*) Bedside lung ultrasound showing areas of tissue-like consolidation with linear air bronchograms (arrows).

Author Contributions: C.-F.L. drafted the manuscript and L.-T.K. revised the manuscript.

Li-Ta Keng, M.D.*
Chien-Feng Lee, M.D.
Nation Taiwan University Hospital Hsin-Chu Branch
Hsin-Chu, Taiwan

ORCID ID: 0000-0003-2772-8037 (L.-T.K.).

*Corresponding author (e-mail: ltkeng@gmail.com).

References

1. Hage CA, Carmona EM, Epelbaum O, Evans SE, Gabe LM, Haydour Q, et al. Microbiological laboratory testing in the diagnosis of fungal infections in pulmonary and critical care practice: an official American Thoracic Society clinical practice guideline. Am J Respir Crit Care Med 2019;200:535–550.
2. Blot SI, Taccone FS, Van den Abeele AM, Bulpa P, Meersseman W, Brusselaers N, et al.; AspICU Study Investigators. A clinical algorithm to diagnose invasive pulmonary aspergillosis in critically ill patients. Am J Respir Crit Care Med 2012;186:56–64.
3. Lamoth F, Calandra T. Early diagnosis of invasive mould infections and disease. J Antimicrob Chemother 2017;72:i19–i28.
4. Corcoran JP, Tazi-Mezalek R, Maldonado F, Yarmus LB, Annema JT, Koegelenberg CFN, et al. State of the art thoracic ultrasound: intervention and therapeutics. Thorax 2017;72:840–849.

Check for updates

Utility of Xpert Ultra on Different Respiratory Specimens in Children

To the Editor:

We read with great interest the recent article on the yield of Xpert Ultra on different respiratory samples in children by Zar and colleagues (1). We must congratulate the authors for conducting such a novel study that will definitively increase the horizon of diagnosis of tuberculosis (TB) in children. However, there are some crucial points in this article that need clarification and further consideration.

The main objective of this study was to investigate diagnostic accuracy and yield of Xpert Ultra on repeated induced sputum (IS), nasopharyngeal aspirates (NPAs), or a combination of IS and NPAs. Although Ultra was performed on repeated (two) NPA specimens, it was performed on only one IS specimen, despite the fact that two IS specimens were collected. The author's previous study had shown that Xpert Ultra had good sensitivity and specificity (77%

and 97%, respectively) on IS (2). Furthermore, in this study, the authors have also concluded that IS provides higher yields than NPAs and that it is a preferable sample for Ultra. Therefore, the inclusion of Xpert Ultra on second IS specimens also might have further increased its sensitivity and specificity.

The semiquantitative results of Xpert Ultra were mainly trace or very low; however, these results were only on NPA specimens. It would be worthwhile to know such results on IS specimens in comparison with NPA specimens.

According to the result of this study, Xpert Ultra was positive on 20 first NPA (17 in confirmed TB and 3 in unconfirmed TB) specimens. In this way, the positive predictive value should be 17/20 (85%); however, in Table 3 of Reference 1, it was mentioned as 156/175 (89.1%). It commences confusion among readers, which needs rectification.

The result of this study gives the impression that Xpert Ultra is more sensitive than Xpert MTB/RIF (74.3% vs. 68.6%, respectively). However, Xpert MTB/RIF was performed only in 165 IS specimens in comparison with Xpert Ultra, which was performed on 195 IS specimens. Therefore, the yield of Xpert Ultra does not seem to be better than the Xpert MTB/RIF, at least on IS specimens. ∎

Saurav Jain, M.D.
Prawin Kumar, M.D.*
Jagdish Prasad Goyal, M.D.
All India Institute of Medical Sciences
Jodhpur, India

ORCID ID: 0000-0002-2365-8097 (P.K.).

*Corresponding author (e-mail: drprawin484@hotmail.com).

References

1. Zar HJ, Workman LJ, Prins M, Bateman LJ, Mbhele SP, Whitman CB, et al. Tuberculosis diagnosis in children using Xpert Ultra on different respiratory specimens. Am J Respir Crit Care Med 2019;200: 1531–1538.
2. Nicol MP, Workman L, Prins M, Bateman L, Ghebrekristos Y, Mbhele S, et al. Accuracy of Xpert Mtb/Rif Ultra for the diagnosis of pulmonary tuberculosis in children. Pediatr Infect Dis J 2018;37:e261–e263.

Check for updates

Reply to Jain *et al.*

From the Authors:

Thanks for the opportunity to respond to these points. As noted, the semiquantitative results of the Xpert Ultra (Cepheid) test were