IASLC
INTERNATIONAL ASSOCIATION FOR THE STUDY OF LUNG CANCER

IASLC 19th World Conference on Lung Cancer
September 23–26, 2018 Toronto, Canada

Comparison of Pulmonary Nodule Location Between Preprocedural CT and Intra-Procedural Cone-Beam CT During Guided Bronchoscopy

Dr. Michael Pritchett, FirstHealth Moore Regional Hospital, Pinehurst Medical Clinic, Pinehurst, NC, USA

Abstract:

Background: Electromagnetic navigation bronchoscopy relies on pre-procedural CT scans to create a virtual airway reconstruction that is used as a roadmap during bronchoscopy. These systems assume similarity between the position of the nodule during bronchoscopy and the pre-procedure CT scan. However, there are multiple factors that suggest that such assumption maybe inaccurate. These include differences in positioning, breathing motion, and the presence of atelectasis. In this study, we evaluated the lung nodule position between pre-procedural CT to interprocedural cone-beam CT (CBCT). In addition, we assessed the ability of a novel augmented endobronchial fluoroscopic guidance system (LungVision, Body Vision Medical Ltd, Israel) to overcome those differences in real-time.

Methods: This was a prospective study of 21 patients with 23 peripheral pulmonary nodules. CT scans were imported into the planning software and the physician identified the nodule and navigation pathway. CBCT (Philips Allura Xper FD20) was used to scan the patient during the procedure. LungVision was used for real-time navigation and guidance during biopsy. The divergence in nodule location between the pre-procedural CT and the interprocedural CBCT was measured.

Results: The average patient age was 69 ± 8.6, median nodule size was 18mm with 74% of the nodules in the upper lobes. The average divergence of the nodule was 14.11 ± 9.9mm. Successful navigation was verified by CBCT in 91% of cases. Malignancy was diagnosed in 20 of 23 nodules for a diagnostic yield of 87%. No adverse events were reported.

Conclusion: This study demonstrates a significant divergence in lesion location between pre-procedural CT and intra-procedural CBCT during guided bronchoscopy. This finding indicates that the change in nodule position between the CT and bronchoscopy could have a great impact on the diagnostic success of the procedure. This movement, sometimes greater than the size of the nodule itself, can lead to an inaccurate localization when relying solely on virtual bronchoscopic or electromagnetic navigation.

CT to patient divergence does not appear to influence the accuracy of this novel navigation platform. The system is capable of tracking the nodules dynamically and can compensate for changes in patient positioning and respiratory motion during both navigation and biopsy which leads to a high diagnostic yield.