Ultrathin Bronchoscopy with and without Virtual Bronchoscopic Navigation Influence of Segmentation on Diagnostic Yield

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Abstract

Background: Bronchoscopy is a safe technique for diagnosing peripheral pulmonary lesions (PPLs), and virtual bronchoscopic navigation (VBN) helps guide the bronchoscope to PPLs. Objectives: We aimed to compare the diagnostic yield of VBN-guided and unguided ultrathin bronchoscopy (UTB) and explore clinical and technical factors associated with better results. We developed a diagnostic algorithm for deciding whether to use VBN to reach PPLs or choose an alternative diagnostic approach. Methods: We compared diagnostic yield between VBN-UTB (prospective cases) and unguided UTB (historical controls) and analyzed the VBN-UTB subgroup to identify clinical and technical variables that could predict the success of VBN-UTB. Results: Fifty-five cases and 110 controls were included. The overall diagnostic yield did not differ between the VBN-guided and unguided arms (47 and 40%, respectively; p = 0.354). Although the yield was slightly higher for PPLs =20 mm in the VBN-UTB arm, the difference was not significant (p = 0.069). No other clinical characteristics were associated with a higher yield in a subgroup analysis, but an 85% diagnostic yield was observed when segmentation was optimal and the PPL was endobronchial (vs. 30% when segmentation was suboptimal and 20% when segmentation was optimal but the PPL was extrabronchial). Conclusions: VBN-guided UTB is not superior to unguided UTB. A greater impact of VBN-guided over unguided UTB is highly dependent on both segmentation quality and an endobronchial location of the PPL. Segmentation quality should be considered before starting a procedure, when an alternative technique that may improve yield can be chosen, saving time and resources..

Keywords

Lung cancer, Peripheral lung lesion, Diagnosis, Bronchoscopy, Ultrathin bronchoscopy, Virtual bronchoscopic navigation.