Letter to the Editor: Diagnostic Value of Virtual Bronchoscopic Navigation in the Bronchial Tuberculosis-Induced Central Airway Stenosis

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Key Summary Points

Without assessing reproducibility (reliability), we cannot talk about diagnostic value of virtual bronchoscopic navigation (VBN).

Sensitivity and specificity can be acceptable; however, considering the rest of validity estimates, our final decision can easily be changed.

Reporting diagnostic added value of VBN by applying receiver operative characteristic curve is crucially important.

I was interested to read the paper by Cheng and colleagues that was published in the March 2020 edition of Infectious Diseases and Therapy [1]. Electronic bronchoscopy is invasive and may cause pain. The purpose of the authors was to explore the clinical value of virtual bronchoscopic navigation (VBN) in the diagnosis of benign central airway stenosis (CAS) secondary to tracheobronchial tuberculosis (TBT). The location, length and diameter of stenosis of 68 patients with benign CAS caused by TBT were independently determined by VBN and electronic bronchoscopy (EOB). The sensitivity and specificity of VBN in identifying stenosis were assessed by EOB as the gold standard. The stenosis was graded into 0%, ≤ 25%, 26–50%, 51–75%, 76–90% and > 90%. They reported that the sensitivity of VBN in determining the degree of stenosis was 98.4%, 100.0%, 100%, 100%, 84.6% and 100%, respectively; the specificity was 91.5%, 96.1%, 97.1%, 97.1%, 97.1% and 97.3%, respectively. They

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concluded that VBN is helpful for the diagnosis of TBT-induced CBS and may provide important information on the location, length, diameter and cross-sectional area of stenosis for further EOB examination and interventional therapy.

First, it is crucial to know that, without assessing reproducibility (reliability, precision, repeatability), we cannot talk about diagnostic value. Reproducibility and validity (accuracy) are two completely different methodological issues of diagnostic value [2]. Second, sensitivity and specificity are among the estimates to assess validity (accuracy) of a diagnostic test, and have nothing to do with reproducibility [2–7]. It should be noted that, due to the limitation of reported values for accuracy (e.g. sensitivity and specificity are generally used for public health purposes and limited in clinical practice), other validity estimates, such as positive predictive value, negative predictive value, and likelihood ratios, should also be taken into account. These estimates are more appropriate for advice about the accuracy of a diagnostic test for clinical purposes. The point is that reported estimates, as in this study, can be acceptable; however, considering the rest of the validity estimates, our final decision can easily be changed. Moreover, none of the above-mentioned estimates can assess reproducibility [2–7]. Third, the receiver operative characteristic curve is usually used to assess diagnostic accuracy (discrimination) of a diagnostic model. However, for clinical purposes, in order to compare two diagnostic tests, reporting diagnostic added value is crucially important. The reason is that all validity estimates can be acceptable, but diagnostic added value may be negligible [2–7]. To sum up, the main clinical points of my letter, in order to assess the diagnostic value of a test, the methodological and statistical issues should carefully be taken into account; otherwise, misinterpretation of the results may occur.

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