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Title: Diagnostic accuracy of the new, virtual bronchoscopy based TBNA navigation system and EBUS-TBNA – A direct comparative study

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Body: The aim of the study. The study was aimed to evaluate the safety and diagnostic accuracy of the newly developed virtual bronchoscopy (VB) based TBNA navigation system as compared to standard EBUS-TBNA procedure. Material and methods. 22 consecutive patients referred for diagnostic bronchoscopy due to mediastinal tumor or lymph node enlargement were enrolled. Segmentation of the airway and mediastinal targets and their spatial reconstruction was performed on site with an additional computer placed on the endoscopy trolley using standard thorax CT data. All patients underwent diagnostic bronchoscopy with VB guided TBNA (VB-TBNA) and EBUS-TBNA. Cytology was assessed by two independent pathologists. Results. 40 nodal stations and 3 mediastinal tumors were sampled with both, VB-TBNA and EBUS-TBNA. The same number of the specific diagnoses was established by VB-TBNA and EBUS-TBNA (lung cancer in 15 pts, sarcoidosis in 2 pts and unknown cause in 5 pts). VB guided cytology and EBUS guided cytology were diagnostic in 21 and 23 mediastinal targets, respectively. Of the remaining, non-diagnostic cytology samples 11 collected with VB-TBNA and 12 collected with EBUS-TBNA contained adequate lymph node samples. No significant complications related to VB-TBNA and EBUS-TBNA procedures were noted. Conclusions. The diagnostic accuracy and safety of VB-TBNA in patients with mediastinal lymphadenopathy is similar to that showed by EBUS-TBNA. Further studies are warranted to evaluate the diagnostic accuracy of VB-TBNA in patients with different lymph node size and different underlying diseases.