

BACKGROUND

- ENB with integrated digital tomosynthesis (DT-ENB) was introduced in 2018 (superDimension, Medtronic, MN, USA), allowing near-real-time intraprocedural nodule visualization and adjustment.
- Shape-sensing robot-assisted bronchoscopy (ssRAB), with improved catheter stability and articulation, has more recently become available.
- The diagnostic performance of DT-ENB and ssRAB appears better than that of legacy systems, but data remain limited and between-study comparisons are hindered by variable diagnostic yield definitions.¹⁻⁵
- We aimed to compare the diagnostic yield of these two novel platforms following their introduction at our institution using the same diagnostic yield definition.

METHODS

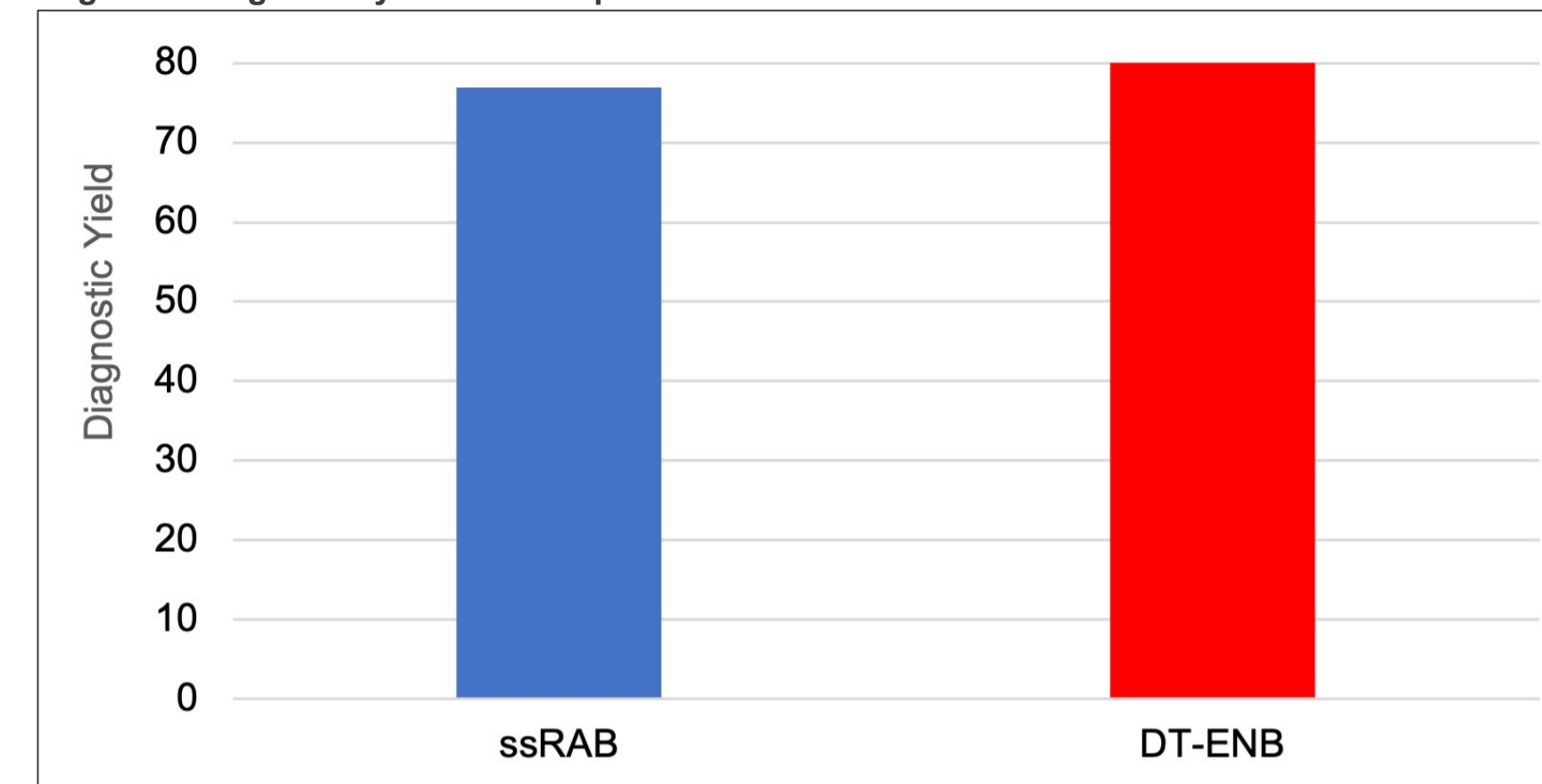
- DT-ENB and ssRAB were introduced in April 2018 and November 2021, respectively. Data pertaining to procedures performed in the six months after each technology was introduced were obtained from a prospectively collected database of consecutive navigational bronchoscopies.
- DT-ENB was used exclusively after its introduction; ssRAB was used exclusively after its introduction except for patients enrolled an RTC requiring DT-ENB (VERITAS, NCT04250194); these were excluded from this analysis.
- This study was approved by the institutional review board (IRB #212187).
- A biopsy was considered diagnostic if it yielded histopathological findings which readily explained the presence of a nodule. Pre-specified lesional findings were malignancy and specific benign histopathological patterns including granulomatous inflammation, organizing pneumonia, and robust neutrophilic inflammation / frank purulence.

RESULTS

- 197 PPLs biopsied in 170 patients with DT-ENB and 143 PPLs biopsied in 133 patients with ssRAB were analyzed.
- DT-ENB and ssRAB groups were well balanced on most demographic and radiographic features.
- The median (IQR) size of lesions biopsied in the DT-ENB and ssRAB cohorts were similar, at 19 mm (IQR 14-28) versus 17 mm (IQR 12-27), respectively.
- The primary outcome of diagnostic yield was similar with ssRAB (77%, 110/143) and DT-ENB (80%, 158/197) (OR 0.8; 95% CI, 0.5-1.4, P=0.4).

RESULTS

Figure 1. Diagnostic yield for both platforms.



- Multivariate logistic regression adjusting for nodule size, presence of bronchus sign, and peripheral third vs. middle third location did not differ from the unadjusted analysis (OR 0.8; 95% CI, 0.4-1.5, P = 0.4).
- The overall diagnostic yield (including PPLs biopsied by both platforms) was affected positively by nodule size, concentric radial EBUS image acquisition, and solid nodule density.
- Pneumothorax occurred in 1.5% (2/133) and 1.8% (3/170) of ssRAB and DT-ENB cases, respectively (P = 0.86).

DISCUSSION

- No difference in diagnostic yield between ssRAB and DT-ENB.
- First study comparing diagnostic performance of these two novel platforms given similar cohorts drawn from the same patient population with the same operators performing procedures within the same six-month window from platform introduction using the same conservative definition of diagnostic yield.
- Randomized trials are needed to confirm these findings and may help further delineate if a particular patient or PPL features predict a higher likelihood of diagnosis with one platform versus the other.

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