AABIP JOURNAL CLUB

Improved diagnosed yield for lung nodules with digital tomosynthesis-corrected navigational bronchoscopy: Initial experience with a novel adjunct

Respirology / 2020

THE CLINICAL QUESTION

What is the diagnostic yield of digital tomosynthesis fluoroscopic-electromagnetic navigation bronchoscopy (F-ENB) when compared with the standard-electromagnetic navigation bronchoscopy (S-ENB)?

TAKE HOME MESSAGE

This retrospective study demonstrated a 25% higher diagnostic yield for pulmonary nodules with the use of F-ENB compared with S-ENB.

BACKGROUND

The diagnostic yield ENB platforms for pulmonary nodules plateau around 70% even with technically successful navigation. This may be due to CT-body divergence (the difference between the pre-procedural location of nodule and its actual location during the procedure), presence or absence of a leading airway, or the effect of atelectasis. Additional procedural techniques are needed to improve the diagnostic yield of EMN bronchoscopy.

This paper highlighted the role of digital fluoroscopic tomosynthesis to ENB and showed the possibility of improving diagnostic yield.

STUDY DESIGN

Type of study: Retrospective review comparing the S-ENB vs. F-ENB before and after the implementation of F-ENB
Setting: Single Academic Medical Center
N: 168
Enrollment: S-ENB Dec 25, 2017 - Apr 24, 2018 and F-ENB from Apr 25 - Aug 25, 2018
Follow up: None
Primary outcome: Comparison of the diagnostic yield between S-ENB vs F-ENB

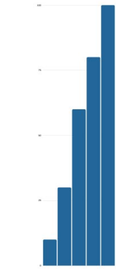
POPULATION

Inclusion criteria: All consecutive ENB procedures during the stud period
Exclusion criteria: n/a
Baseline Characteristics:

S-ENB
Mean age 64.4
15.3% current smoker
Median size of nodule 15 mm
63.3% target nodules <20 mm

F-ENB
Mean age 62.2
1.7% current smoker
Median size of nodule 16 mm
64.1% target nodules <20 mm

OUTCOMES



Primary outcome: Diagnostic yield
F-ENB 79% vs S-ENB 54% (p = 0.0019)

Secondary outcomes:

- F-ENB: 66% had diagnosis made by cytology alone, 18% by histology alone, and 11% by both cytology and histology
- S-ENB: 43% had diagnosis by cytology alone, 8% by histology alone, and 33% by both cytology and histology
- The use of F-ENB and presence of concentric or eccentric radial EBUS view are associated with successful diagnosis

Adverse events:

- Pneumothorax: 2% (S-ENB) and 1.5% (F-ENB)
- Bleeding requiring interventions: 0.9% (S-ENB) and 0 (F-ENB)
- Respiratory failure: 0.9% (S-ENB) and 0 (F-ENB)

COMMENTARY

This study suggests that the use of fluoroscopic tomosynthesis for more accurate visualization of target lesions may improve diagnostic yield for pulmonary nodules with a comparable safety profile as compared to S-ENB.

The retrospective single-center design of this study may be associated with selection bias, which may be a potential limitation for broader application, however, may warrant additional prospective investigation.

FUNDING

- Medtronic

SUGGESTED READING

- Casal RF, Sarkiss M, Jones AK, Stewart J, Tam A, Grosu HB, et al. Cone beam computed tomography-guided thin/ultrathin bronchoscopy for diagnosis of peripheral lung nodules: a prospective pilot study. J Thorac Dis. 2018;10(12):6950-9.
- Folch EE, Pritchett MA, Nead MA, Bowling MR, Murgu SD, Krimsky WS, et al. Electromagnetic Navigation Bronchoscopy for Peripheral Pulmonary Lesions: One-Year Results of the Prospective, Multicenter NAVIGATE Study. J Thorac Oncol. 2019;14(3):445-58.
- Sagar AS, Sabath BF, Eapen GA, Song J, Marcoux M, Sarkiss M, et al. Incidence and Location of Atelectasis Developed During Bronchoscopy Under General Anesthesia: The I-LOCATE Trial. Chest. 2020;158(6):2658-66.

ARTICLE CITATION

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