

Impact of practical sequence between PET-CT and EBUS-TBNA on lymph node staging in lung cancer

전남대학교 의과대학 화순전남대학교병원 내과학교실¹, 화순전남대학교병원 폐식도종양클리닉², 전남대학교 의과대학 화순전남대학교병원 병리학교실³, 전남대학교 의과대학 화순전남대학교병원 핵의학교실⁴, 전남대학교 의과대학 화순전남대학교병원 흉부외과교실⁵

진준선^{1,2}, 오형주^{1,2}, 김민석^{1,2}, 고보진^{1,2}, 강세령^{2,4}, 윤주식^{2,5}, 최유덕^{2,3}, 오인재^{1,2}, 송상윤^{2,5}, 김영철^{1,2}, 나국주^{2,5}, 범희승^{2,4}, 박철규^{1,2}

Background/Aims: Positron emission tomography-computed tomography (PET-CT) with fluorine-18-fluorodeoxyglucose (18F-FDG) has a high sensitivity in detection of lung cancer, but metabolic activity can be exaggerated by inflammatory reaction after biopsy procedure. This study was aimed to investigate diagnostic accuracy and impact of practical sequence between PET-CT and endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) on lymph node staging in lung cancer.

Methods: EBUS-TBNA for intrathoracic lymph nodes were performed in 1405 patients and 762 patients were confirmed with lung cancer between January 2016 and April 2020. We retrospectively recruited patients who were examined with staging PET-CT and EBUS-TBNA simultaneously followed by surgical resection with lymph node dissection or systematic sampling. Pathologic findings after surgery served as the reference standard.

Results: A total of 48 patients were enrolled in our study and 79 intrathoracic lymph nodes were examined by EBUS-TBNA. Sensitivity and specificity of PET-CT were 79.2% and 66.7% on a per-patient basis and 80.0% and 80.3% on a per-node station basis. Sensitivity and specificity of EBUS-TBNA were 48.0% and 87.0% on a per-patient basis and 59.3% and 94.0% on a per-node station basis. On a per-patient basis, there were 11 false-positive cases in the PET-CT after EBUS group (11/42, 26.2%), while there was no false-positive case in the EBUS after PET-CT group. In the PET-CT after EBUS group, there was a trend of SUVmax increase in lymph nodes of true-positive cases than false-positive cases (mean±SD, 8.2±3.6 versus 5.7±2.6, p=0.126).

Conclusions: A sequence of PET-CT after EBUS-TBNA could show a modest increase in metabolic activity, but there was little impact of EBUS-TBNA on false-positive results of PET-CT.

Figure 1. Algorithm for enrolling the patients

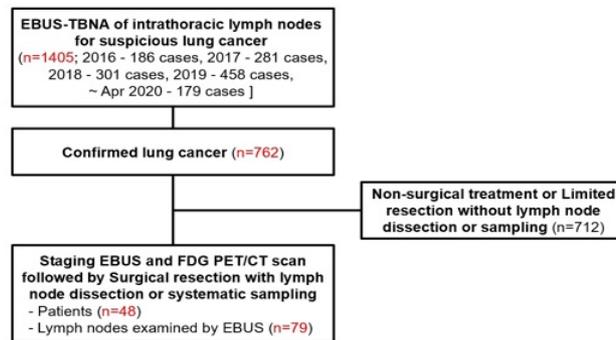


Table 1. Diagnostic accuracy for lymph node staging

Ref. Surgery	Per-patient basis		Per-node station basis	
	EBUS-TBNA (n=48)	FDG PET/CT (n=48)	EBUS-TBNA (n=77)	FDG PET/CT (n=96)
Sensitivity	48.0%	79.2%	59.3%	80.0%
Specificity	87.0%	66.7%	94.0%	80.3%
PPV ^(a)	80.0%	70.4%	84.2%	70.0%
NPV ^(b)	60.6%	76.2%	81.0%	87.5%

Table 2. Diagnostic accuracy of FDG PET/CT for LN staging according to sequence of EBUS-TBNA

Per-patient basis	EBUS → PET (n=42)	PET → EBUS (n=6)	p
PET false positive (n=11)	11 (26.2%)	0 (0.0%)	0.313
PET-positive LN SUVmax (n=29), mean(SD)	n=24, 7.1 (3.48)	n=5, 4.6 (1.44)	0.1
True positive	n=13, 8.2 (3.62)	n=5, 4.6 (1.44)	0.126
False positive	n=11, 5.7 (2.64)	0	