

15 mm

1

: 15 mm

: 2002 4 2003 5
가 25 . 14 , 11
, 52,5 .
CT PCNB , ,
. PCNB chi-square test ,
Spearman's rank's test .
: 25 2 . 23
7 (30.4%), 16 (69.6%) , PCNB 20 (87%) .
6 (30%) , 14 (70%) . 85.7% (6/7),
100% (16/16) , 87.5% (14/16), 85.7% (6/7)
. 9 (36%) . 9 4 (16%)
, 5 (20%) . ,
가 (r=0.3, p=0.15).
: 15 mm CT PCNB
가 .

(Computed tomography, CT) 가 (10).
가
(solitary pulmonary nodule, SPN) 가 , FNAB
(1). , 10 mm 15 mm .
FNAB
, 가 , PCNB , 15 mm
가 (1-3).
(transthoracic needle biopsy, TNB) .
(percutaneous fine needle aspi-
ration biopsy, FNAB) (percutaneous cut-
ting needle biopsy, PCNB) (4, 5). FNAB
, , 2002 4 2003 5
82-99% , 15 mm
39-77% (6-9).
, 25 11 , 14 .
39-77 (52.5) , PCNB
12±0.3 mm ,
1/3 . 25

“ 2003 2003 7 23 2004 2 27 . 25 1/3 . 25

: 15 mm

6
(2, 2, 1, 1).
(6 - 12)

PCNB 18 G automatic cutting needle (ASAP Detachable;
Medi - tech/Boston Scientific, Watertown, Mass)

가 18 , , 18

(Somatom Plus 4, Siemens, Eerlangen, Germany)

CT 가 (Fig. 1A). 가
CT (Fig. 1B).
가

2 cm ,

CT
가 (Fig.
1C).

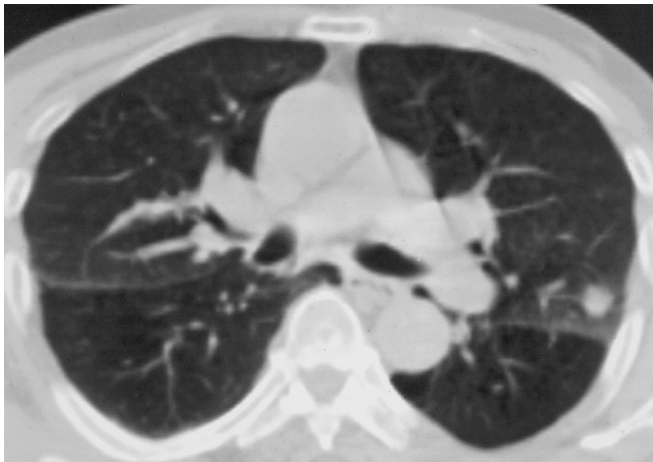
(n=2).

(n=1, 4%)

, 1
1 - mm CT
4

CT PCNB
(10 mm , 10 - 15 mm)

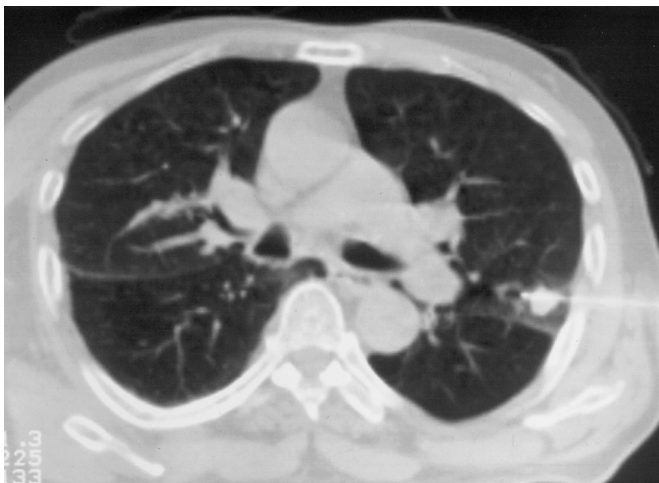
. PCNB



A



B



C

Fig. 1. Bronchial asthma in a 73-year-old man.
A. Initial CT scan obtained before biopsy showed solitary pulmonary nodule (12 mm) in LUL.
B. CT scan obtained before biopsy helps confirm that the outer cannula with its introducer stylet (arrow) is positioned adequately.
C. CT scan obtained after the biopsy gun has been fired shows the cutting needle in the wall of the lesion. The coaxial needle has advanced 2 cm, and the exact biopsy site is shown. Squamous cell carcinoma was diagnosed at histologic analysis.

Chi-square test

Spearman's rank's test, P-value가 0.05

가

가

($r=0.3$, $p=0.15$).

가

CT

가

가

TNB,

. 25

PCNB

(fiberoptic bronchoscopy, FOB),

(video-assisted thoracoscopic surgery, VATS)

TNB FOB

CT

FOB

CT

(6, 7, 11). VATS TNB

, TNB

23

7

16

. 6

3 (50%)

23

PCNB

20 (87%)

3 1

가

, 2

. PCNB

80% (20/25)

PCNB

85.7% 100%

PCNB

87.5% 85.7% (Table 1 and 2). 10 mm

10 7 (70%)

15 mm

15 13 (86.7%)

, 10 mm

($p>0.05$).

CT

12 ± 0.3 mm

7 ± 0.4 mm

CT

11 ± 0.3 mm

5 ± 0.3

mm

CT

12 ± 0.3 mm

7 ± 0.5 mm

(Table 3).

9 (36%)

4

(16%)

5 (20%)

8

, 1 (4%)

. 25

8 (32%)

3 (37.5%)

Table 1. Final Diagnoses Attained with Biopsy

Diagnosis	Number of Lesions (n=20)
Benign	
Tuberculoma	10
Harmatoma	1
Aspergilloma	1
Paragonimiasis	1
Eosinophilic pneumonia	1
Malignant	
Primary malignancy	
Squamous cell carcinoma	1
Adenocarcinoma	1
Small cell carcinoma	1
Metastases	
Breast	1
Colon	1
Lung	1

Table 2. Statistics of Percutaneous Cutting Needle Biopsy for the Diagnosis of the Definitively Diagnosed Lung Lesions

	Benignity (n=14)	Malignancy (n=6)
Sensitivity	87.5%	85.7%
Specificity	85.7%	100%

Note. - Sensitivity and specificity were measured with a Chi-square test.

Table 3. Comparison of the Size of Pulmonary Nodules with the Length of Each Core Biopsy

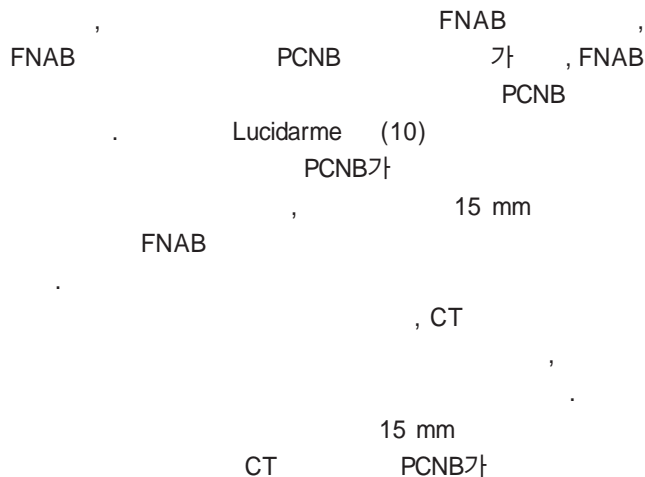
	RUL	RML	RLL	LUL	LLL	Total
Number of SPN	n=8	n=2	n=4	n=5	n=6	25
Mean diameter (mm) of Lesions	11 (6 - 5)	14 (12 - 15)	11 (5 - 15)	12 (9 - 15)	10 (5 - 15)	
Mean diameter of specimens (mm)	9 (3 - 17)	3 (1 - 4)	5 (3 - 8)	5 (3 - 9)	6 (2 - 12)	

Note. - Values are mean; values in parentheses are ranges, SPN = solitary pulmonary nodule, RUL = right upper lobe, RML = right middle lobe, RLL = right lower lobe, LUL = left upper lobe, LLL = left lower lobe

: 15 mm

FOB TNB FNAB
(12, 13). 가
CT 12 mm ,
(1-3). CT 7 mm CT
, 가 58%
, 가 2cm 가
50% 가 PCNB CT
가 가
(14, 15). 가 FNAB
가 가
FNAB PCNB
가 가
가 FNAB 7.6 - 46% , PCNB
가 9 - 54%
(4 - 10). (4, 5, 8 - 10, 16, 21, 22).
FNAB 가
가 가
(5 - 10, 22 - 25). 10 mm
가 가
(9, 10, 16). Wallace (8) 10 mm
PCNB 62%
가 Cox (23) 10 mm
(10, 16). 31% 65%
20% (5/25)
(9 - 54%) 10 mm
8% (2/25) 1
Wallace (8)
15 mm
PCNB가 FNAB
(1), (1/3)
91% 96% 가 가
, Wallace (8) 0.8
FNAB
cm 0.8 - 1 cm 17 2 (11.8%)
가 70% 92% . Lrie (20) CT fluo - 8 3 (37.5%)
roscopy
1 cm 가 76%
15 mm PCNB ,
10 mm 10 -
15 mm 70%
86.7% , 15 mm
PCNB가 16% (4/25)
FNAB
FNAB 2.4 - 5.5 %
CT
(10). Santambrogio (9) PCNB

. McLoud TC (28)



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Usefulness of CT-Guided Automatic Needle Biopsy of Solitary Pulmonary Nodule Smaller than 15 mm¹

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Purpose: To evaluate the usefulness of the CT-guided percutaneous lung biopsy for the solitary pulmonary nodules smaller than 15 mm in diameter.

Materials and Methods: Between April 2002 and May 2003, we evaluated twenty-five patients (11 men, 14 women, mean ages: 52.5 years) who had solitary pulmonary nodules, which we could not discriminate as being benign or malignant on the CT findings. All the subjects had CT-guided percutaneous cutting needle biopsy (PCNB) performed on them at our institution. A definitive diagnosis of benignity or malignancy was established to retrospectively analyze the patient's records. We evaluated the accuracy, sensitivity, specificity and complications of PCNB for the definitive diagnosis of benignity or malignancy. The sensitivity and specificity of PCNB were determined using the Chi-square test, and the correlations with pneumothorax and emphysema after biopsy were analyzed using Spearman's rank correlation coefficient.

Results: In two nodules of the twenty-five nodules, no definitive diagnosis could be established. Of the remaining twenty-three nodules, 7 (30.4%) were malignant and 16 (69.6%) were benign. Twenty (87%) of the twenty-three definitively diagnosed nodules were correctly diagnosed with PCNB. Of the twenty nodules, 6 (30%) were malignant and 14 (70%) were benign. The sensitivity and specificity of the malignant nodules were 85.7% (6/7) and 100% (16/16), respectively. The sensitivity and specificity of the benign nodules were 87.5% (14/16) and 85.7% (6/7), respectively. Post-biopsy complication occurred in nine patients (36%): Hemoptysis ($n=4$, 16%) and pneumothorax ($n=5$, 20%). However, there was not a statistical significance between pneumothorax and emphysema after biopsy ($r=0.3$, $p=0.15$).

Conclusion: When CT-guided percutaneous lung biopsy of the solitary pulmonary nodules smaller than 15 mm in diameter was performed without an on-site cytopathologist, we know that PCNB can yield high diagnostic accuracy and very few complications.

Index words : Biopsies, technology

Computed tomography (CT), guidance

Interventional procedures, complications

Lung, biopsy

Lung neoplasms

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