

가 CT (CT fluoroscopy)
 : CT 18 288
 가 CT 18
 가 CT 가
 가 2 가 2
 1 , 가 2
 , 1) , 2) , 3)
 , 4)
 : 22 19 86.3%
 12 (63.2%) , 7 (36.8%) 1 12
 (54.5%), 2 10 (45.5%)
 가 1 cm 11 9 (81.8%)가 1 , 2 (18.2%)가 2 ,
 가 1 cm 11 3 (30%)가 1 , 8 (70%)가 2
 가 가 (p = 0.03)
 가 (p > 0.05).
 : , CT
 가

(Transthoracic needle biopsy, TNB)
 (computed TNB
 tomography, CT) CT (computed tomography fluoroscopy system)
 TNB . CT
 가 , 가
 (1). CT TNB (guiding
 modality) 20 가 , CT
 가 , (3-6). CT TNB
 CT TNB , 가 가 (3).
 CT
 1
 2006 1 17 2006 4 20 (3).
 143

가 : CT

TNB CT , X

가 가 , CT 120 kV, 50 mA

가 . CT , 10 mm . X

0.75 1 8 CT

TNB 가

CT Bard Magnum Reusable Biopsy System
(C.R.Bard, Murray Hill, NJ, U.S.A.) 18 gauge disposable
core biopsy needle

CT PCNB 5 1

2 CT

가

2003 1 2005 8 CT

(percutaneous automated cutting needle
biopsy, PCNB) 317 49 (15.7%)

가

22

18 , 4 , 62.7

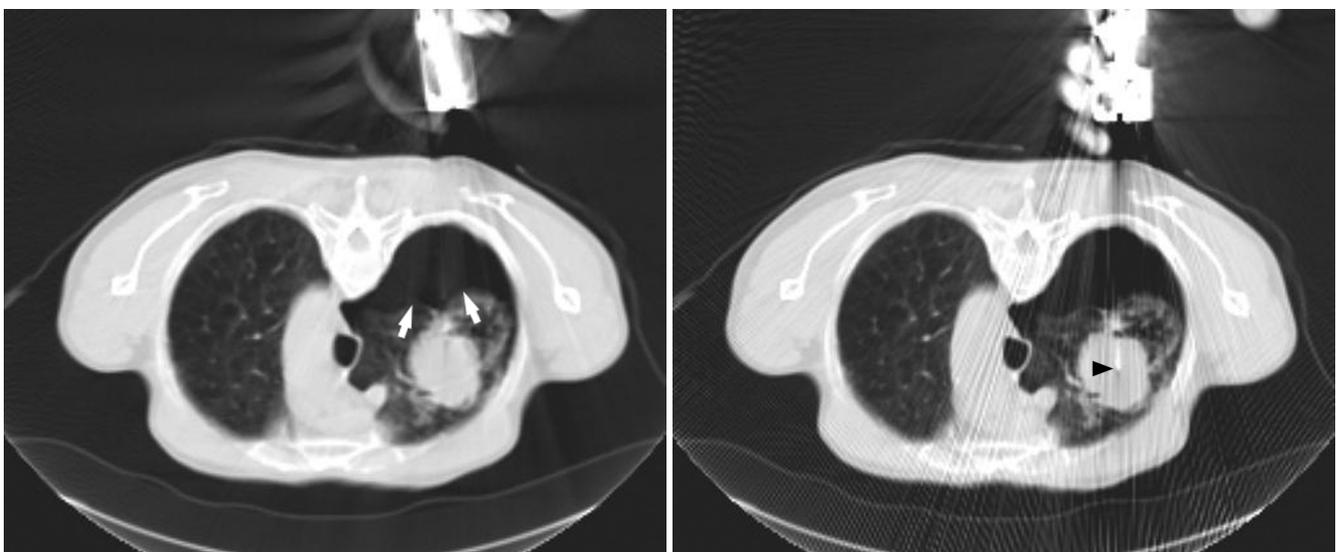
1.1 - 7.3 cm (2.9 cm) ,

0 - 5.1 cm (1.58 cm)

CT (Somatom Plus 4, Siemens medical
system, Forchheim, Germany) "Care vision
package" CT . CT

가

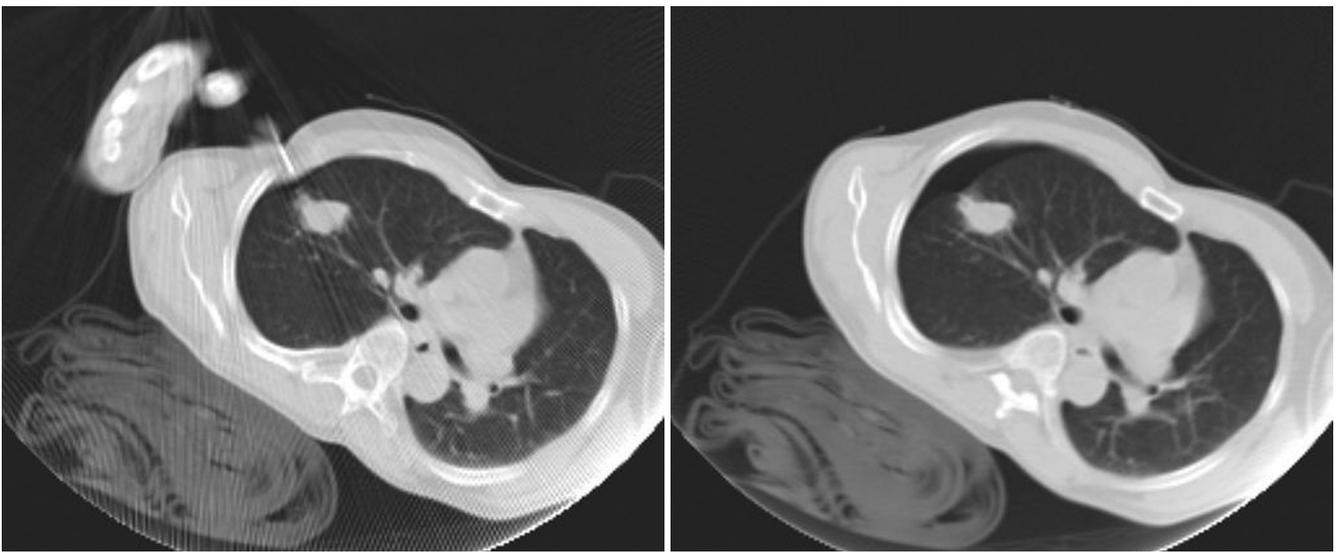
가 CT



A **B**

Fig. 1. Squamous cell carcinoma in a 74-year-old man.
A. Large amount of right pneumothorax (arrows) was noted because of previous lung biopsy.
B. Accurate CT fluoroscopic biopsy could be performed through a pneumothorax. The needle-tip sign (arrowhead) indicates correct positioning of the biopsy needle.

가가
 , CT
 (Fig. 1).
 1.4)
 2 24
 PCNB CT
 가 2
 가 가 2
 PCNB
 1 cm
 가 1 2
 2 cm 2
 PCNB
 Fischer's exact test
 가 PCNB 22
 19 86.3%
 12 63.2% , (adenocarcinoma)
 6 가 , (squamous cell carcinoma) 3 ,
 (bronchioloalveolar carcinoma) 1 ,
 (nonsmall cell carcinoma) 1 ,
 (small cell carcinoma) 1 .
 CT
 7 36.8% , 4 가 ,
 2 , 1
 3 가 가 2
 가 1
 CT
 3.3 .
 가 1 22 12 (54.5%)
 가 가 2 10 (45.5%) 0.78 cm (0.2 cm -
 2.2 cm) 가 CT
 1.49 cm (0.3 cm - 7.0 cm)
 22 20 , 2
 가 2 cm . 1 18
 , 1 CT
 가 1 cm 11
 9 (81.8%)가 1 , 2 (18.2%)가 2 ,
 가 1 cm 11 3 (30%)
 가 1 , 8 (70%)가 2 가
 가 (p = 0.03).
 11 5



A
Fig. 2. Tuberculosis in a 69-year-old man.
A. Small amount of right pneumothorax was noted after lung biopsy. Maximum diameter in pneumothorax was 10.5 mm.
B. There is increase in the size of pneumothorax after biopsy. Maximum diameter in pneumothorax was 20.1 mm (group 2).

Usefulness of CT Fluoroscopy-guided Percutaneous Needle Biopsy in the Presence of Pneumothorax During Biopsy¹

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Purpose: When pneumothorax occurs during a percutaneous needle biopsy, the radiologist usually stops the biopsy. We evaluated the usefulness of computed tomographic (CT) fluoroscopy-guided percutaneous needle biopsy in the presence of pneumothorax during biopsy.

Materials and Methods: We performed 288 CT fluoroscopy guided percutaneous needle biopsies to diagnose the pulmonary nodules. Twenty two of these patients had pneumothorax that occurred during the biopsy without obtaining an adequate specimen. After pneumothorax occurred, we performed immediate CT fluoroscopy guided percutaneous needle biopsies using an 18-gauge cutting needle. We evaluated the success rate of the biopsies and also whether or not the pneumothorax progressed. We classified these patients into two groups according to whether the pneumothorax progressed (Group 2) or not (Group 1) by measuring the longest distance between the parietal pleura and the visceral pleura both in the early and late pneumothorax. Additionally, we analyzed the relationship between the progression of pneumothorax after biopsy and 1) the depth of the pulmonary nodule; 2) the number of biopsies; 3) the presence or absence of emphysema at the biopsy site; and 4) the size of the pulmonary nodule.

Results: Biopsy was successful in 19 of 22 nodules (86.3%). Of the 19 nodules, 12 (63.2%) were malignant and 7 (36.8%) were benign. Twelve patients (54.5%) were classified as group 1 and 10 patients (45.4%) as group 2. The distance between the lung lesion and pleura showed a statistically significant difference between these two groups: 1 cm in distance for group 1 (81.8%) and group 2 (18.2%), and > 1 cm in distance for group 1 (30%) and group 2 (70%), $p < 0.03$. Yet the number of biopsies, the presence or absence of emphysema at the biopsy site and the size of the pulmonary nodules were not related to the progression of pneumothorax ($p > 0.05$).

Conclusion: When early pneumothorax occurs during a biopsy, CT fluoroscopy guided percutaneous needle biopsy is an effective and safe procedure. Aggravation of pneumothorax after biopsy is affected by the depth of the pulmonary nodule.

Index words : Biopsies, technology
Lung, CT
Lung, biopsy
Pneumothorax

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