



中國醫藥大學附設醫院
China Medical University Hospital

Radial probe-EBUS and EBUS-GS and 簡介及操作介紹

廖偉志 醫師

中國醫藥大學附設醫院
胸腔內科



Outlines

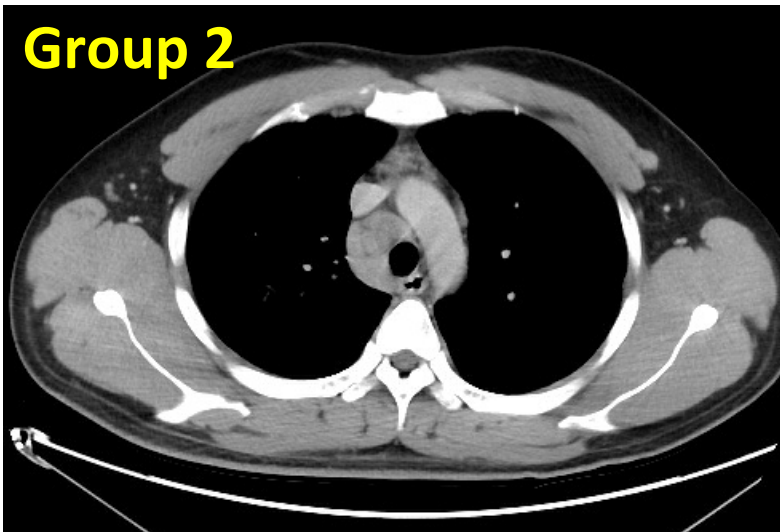
Introduction of EBUS

EBUS 簡介

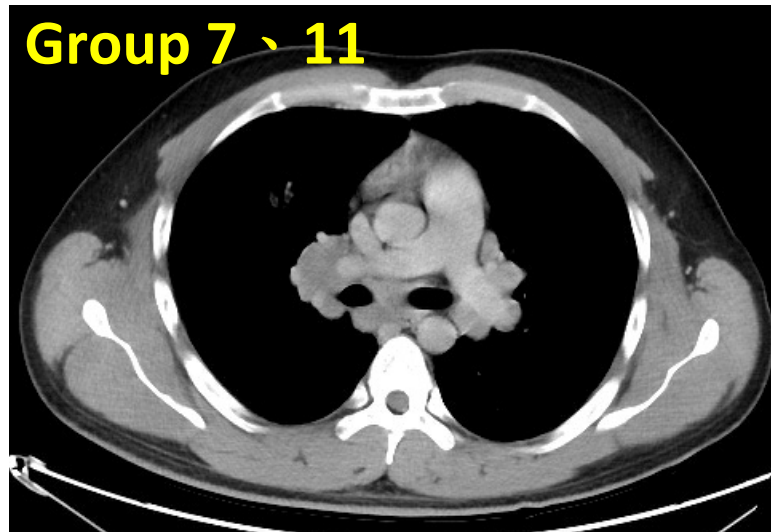
EBUS and EBUS-GS 操作簡介



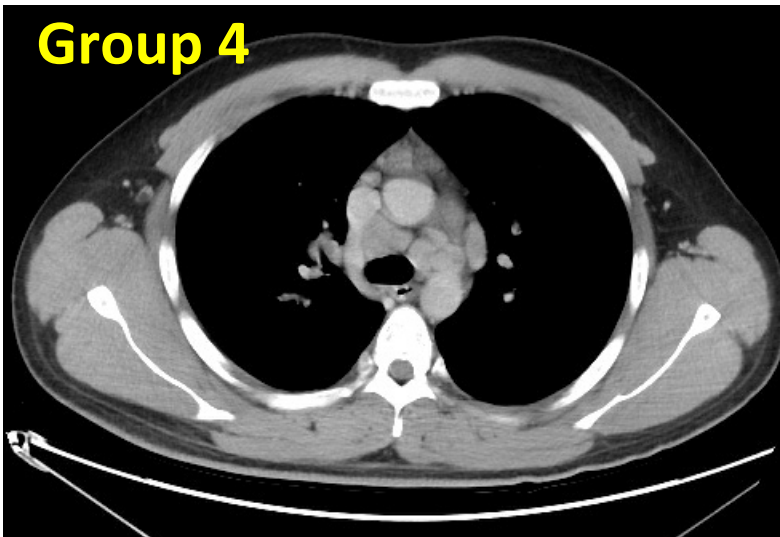
Group 2



Group 7、11

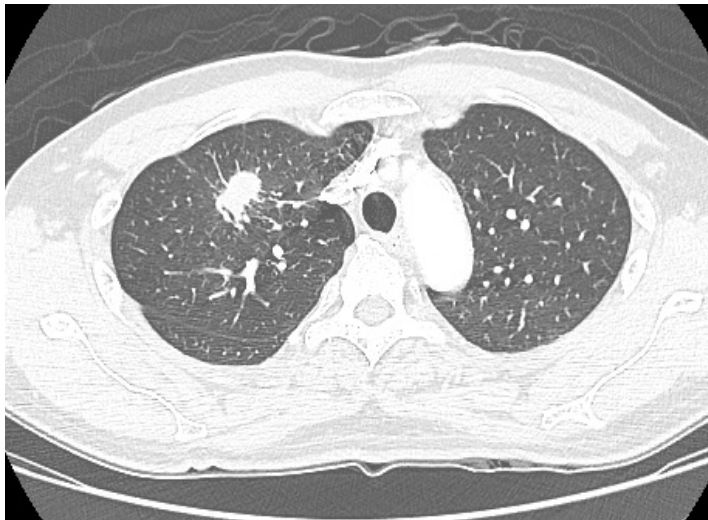


Group 4



EBUS-TBNA

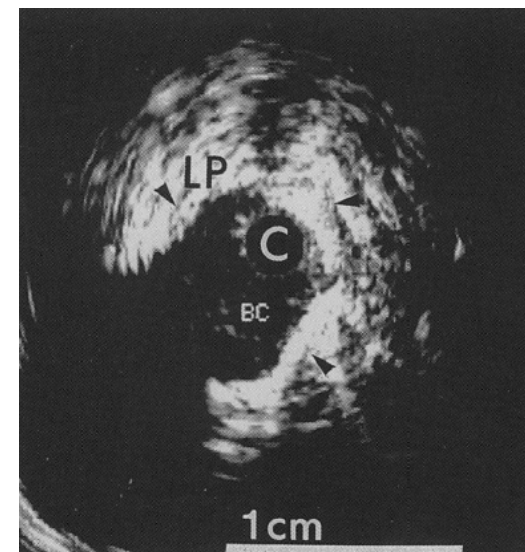
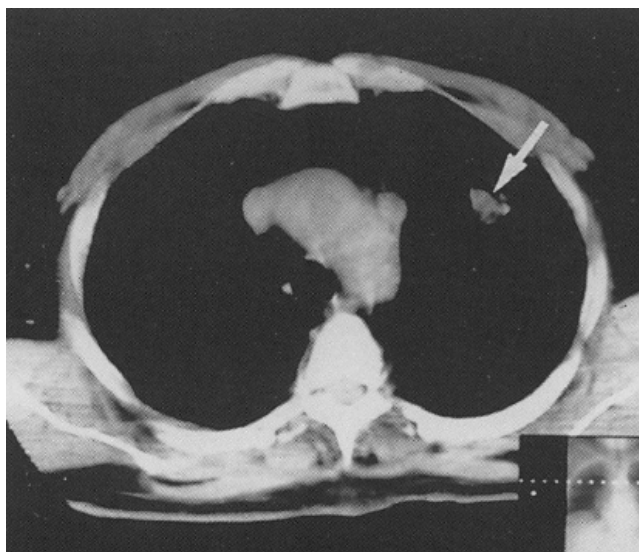
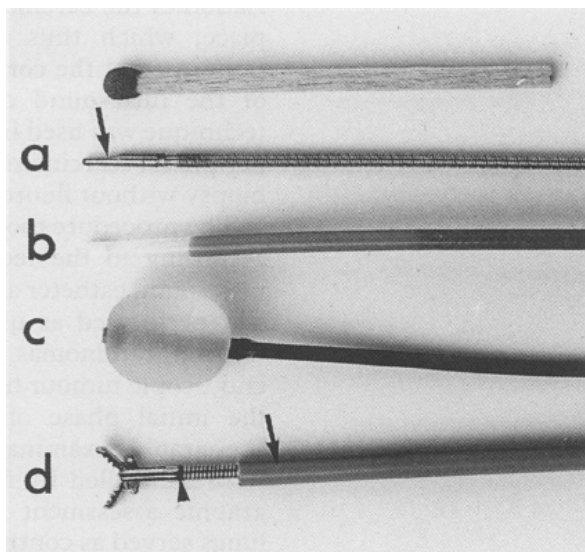




New techniques

Editor: P M A Calverley

Endobronchial sonography: feasibility and preliminary results Hurter T, Hanrath P. Thorax. **1992**;47:565

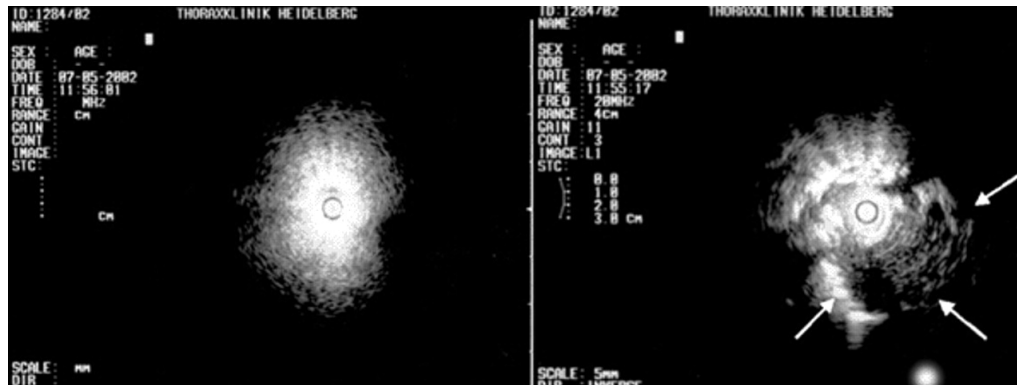


- Jan. 1990 - Feb. 1991
- 100 pts, 77 male, 74 central, 51 bronchial carcinoma



Endobronchial ultrasound-guided transbronchial lung biopsy in solitary pulmonary nodules and peripheral lesions

F.J.F. Herth*, A. Ernst[#], H.D. Becker*



	Lesion <3 cm	Lesion >3 cm
Patients n	21	29
EBUS n (%)	17 (80)	23 (79)
Fluoroscopic n (%)	12 (57)	26 (89)

Herth FJ, Ernst A, Becker HD. Eur Respir J. **2002**;20:972



Noriaki Kurimoto



clinical investigations

Analysis of the Internal Structure of Peripheral Pulmonary Lesions Using Endobronchial Ultrasonography*

CHEST **2002**; 122:1887

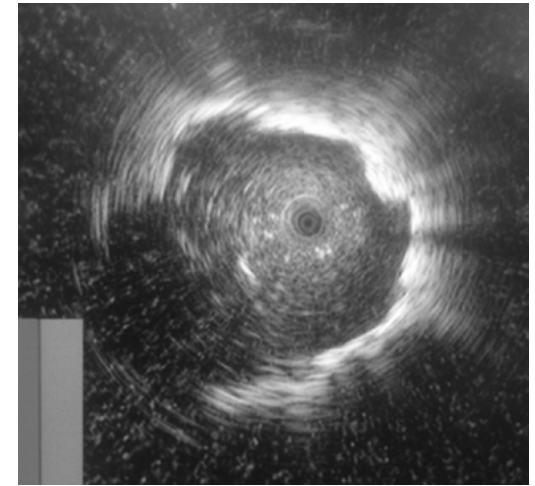
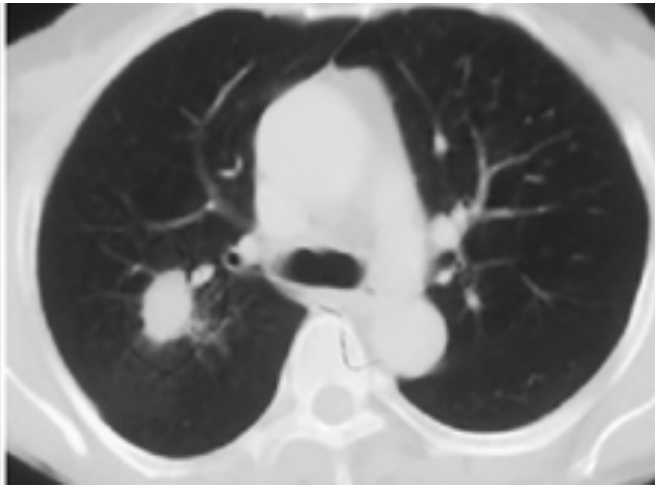
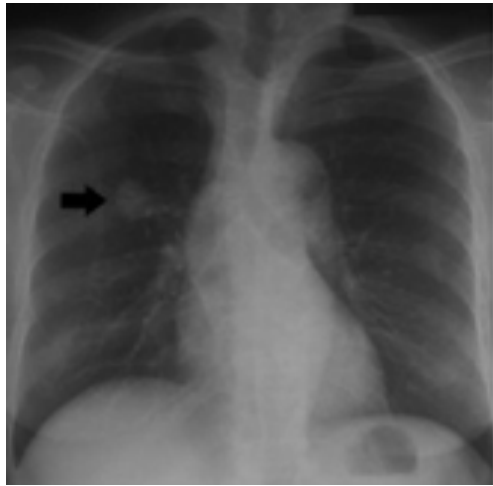
Endobronchial Ultrasonography Using a Guide Sheath Increases the Ability To Diagnose Peripheral Pulmonary Lesions Endoscopically*

CHEST **2004**; 126:959



Use of radial probe endobronchial ultrasound for the diagnosis of peripheral pulmonary lesion: **First report from India**

- A 62-year old lady presented with history of dry cough of one-month duration.



Lung India. **2016 Mar-Apr**; 33(2): 212–215



Radial probe endobronchial ultrasound



Outlines

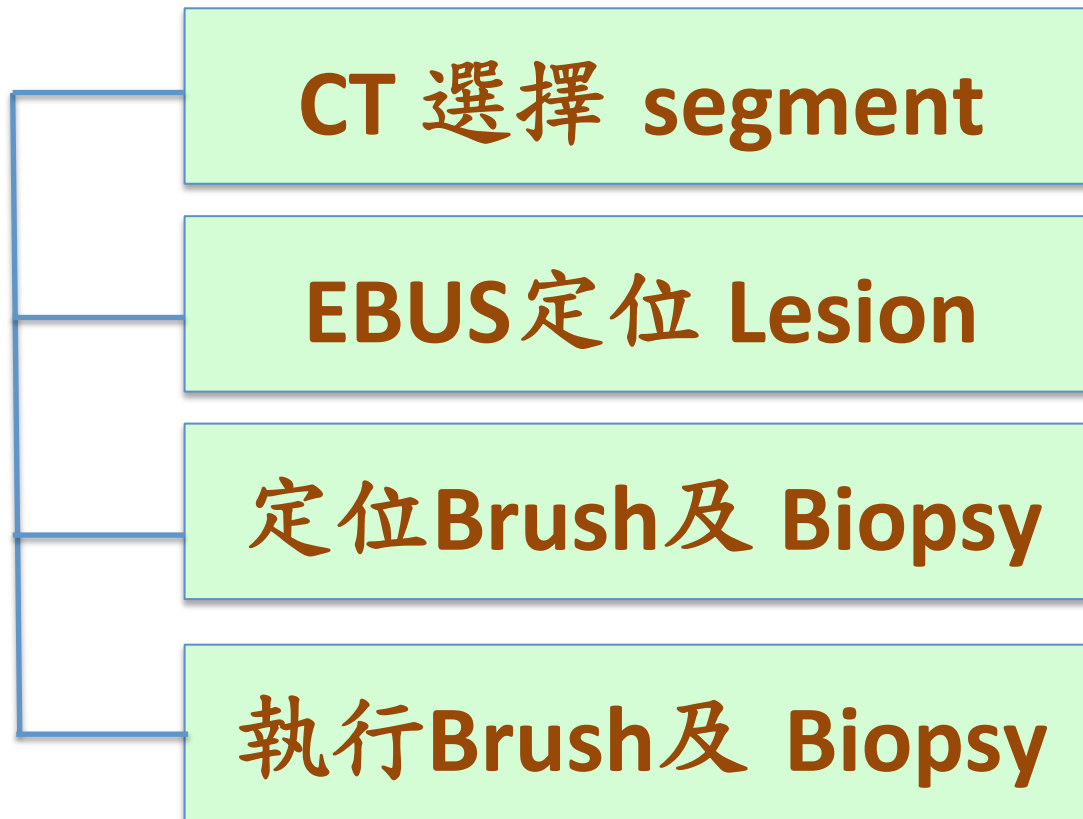
Introduction of EBUS

EBUS 簡介

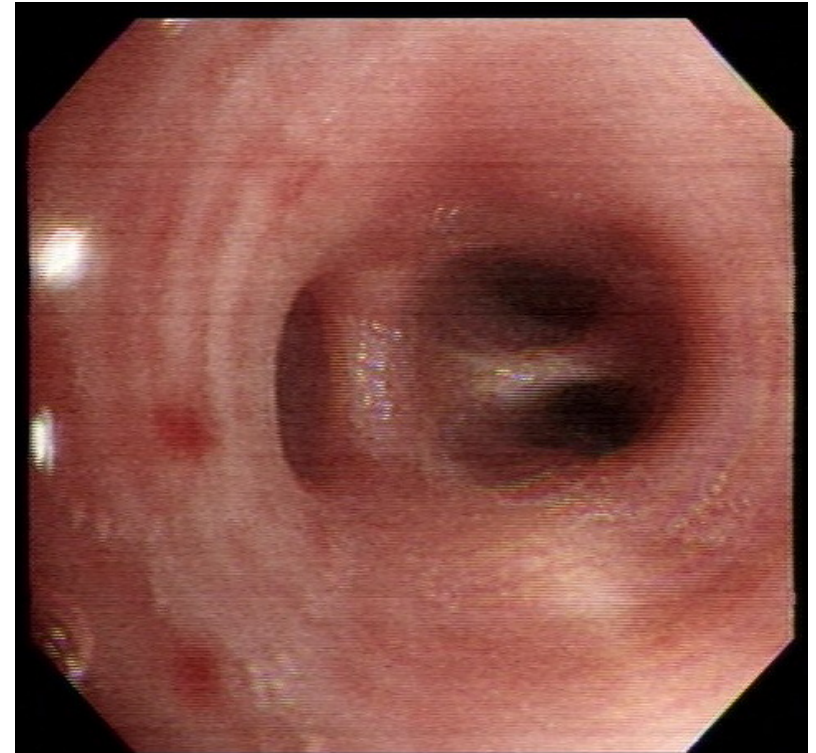
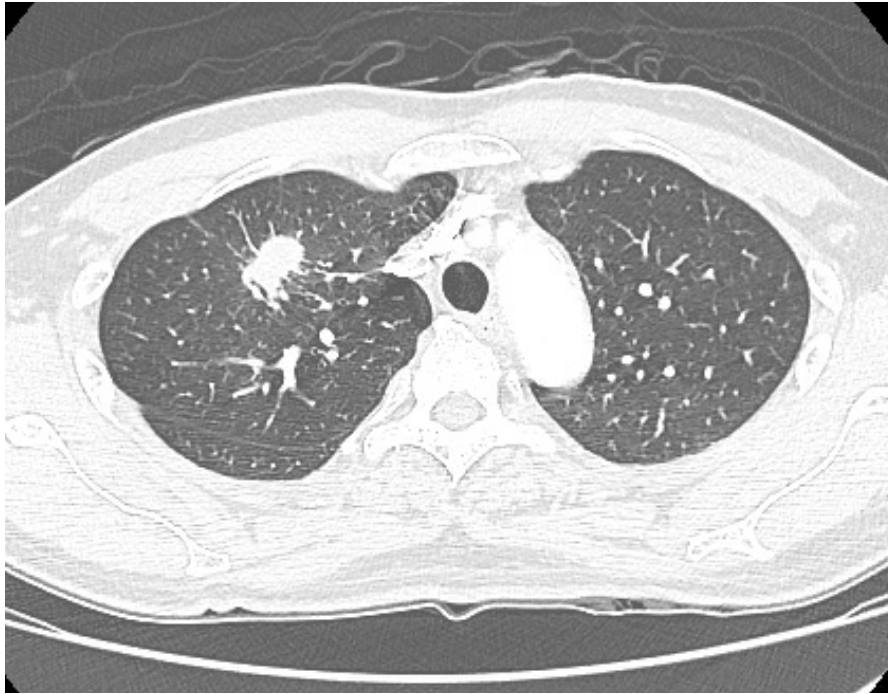
EBUS-GS 操作簡介

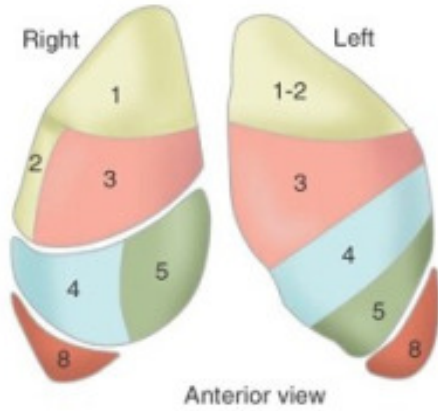


EBUS Procedure

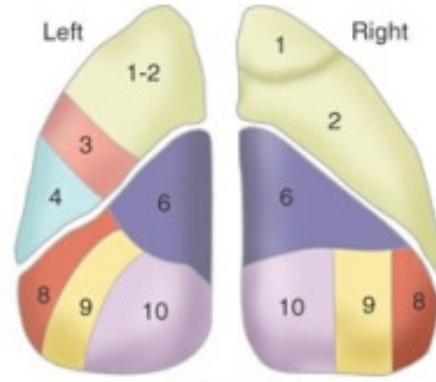


Select the orifice of bronchus

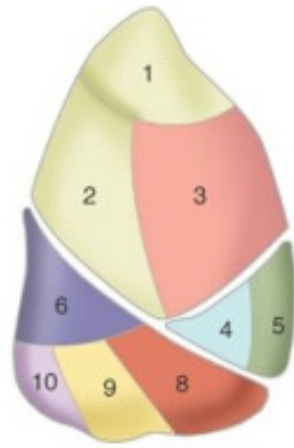




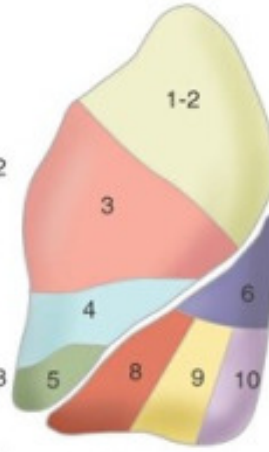
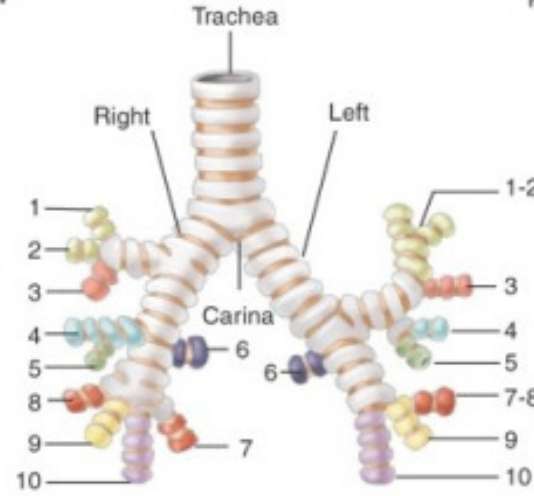
Anterior view



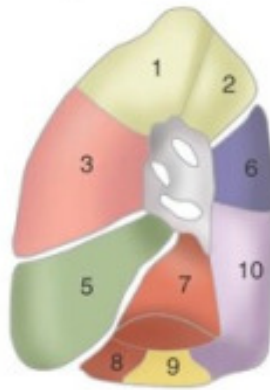
Posterior view



Right lateral view

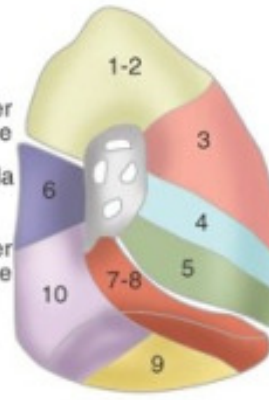


Left lateral view



Right medial view

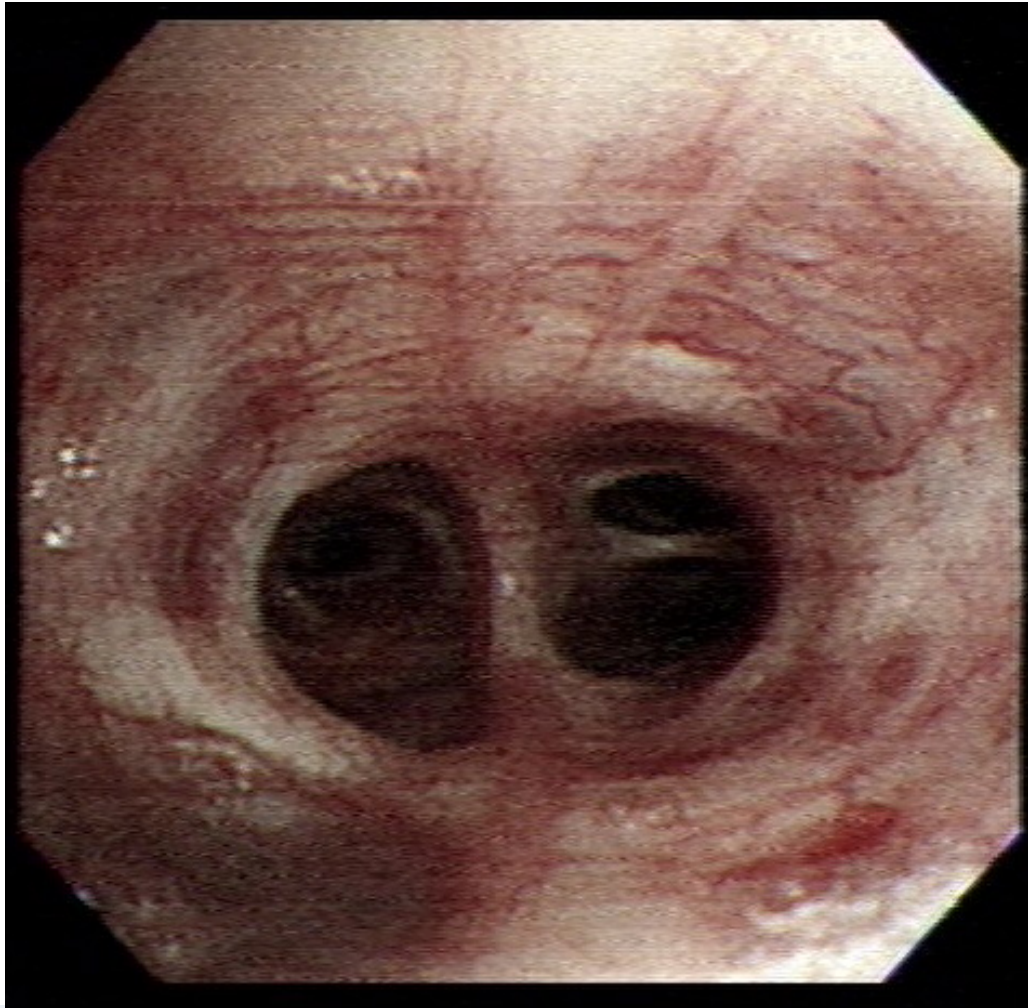
- | | | |
|-------------|-----------------|-----------------------|
| Upper lobe | 1. Apical | 1-2. Apical-posterior |
| | 2. Posterior | 3. Anterior |
| | 3. Anterior | 4. Superior |
| Middle lobe | 4. Lateral | 5. Inferior |
| | 5. Medial | 6. Superior |
| Lower lobe | 6. Superior | 7-8. Ant. basal |
| | 7. Med. basal | 9. Lat. basal |
| | 8. Lat. basal | 10. Post. basal |
| | 9. Lat. basal | |
| | 10. Post. basal | |



Left medial view



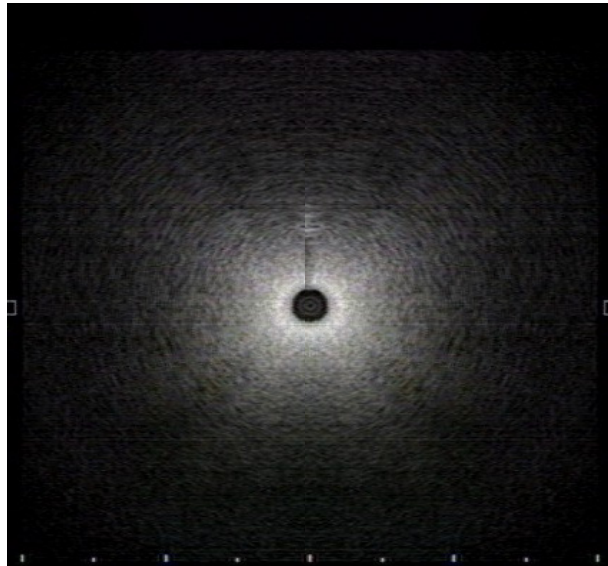
Which one?



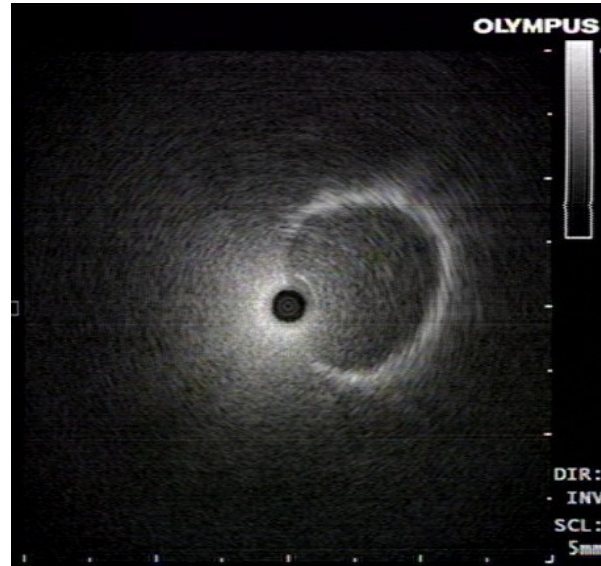


Images of EBUS

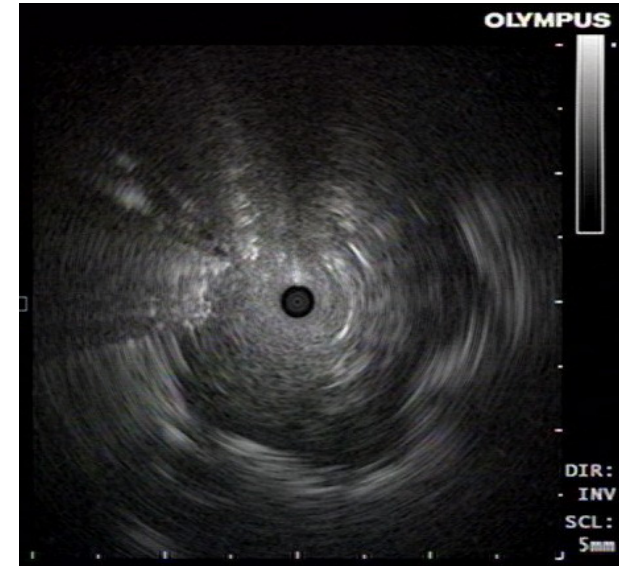
Unfound



Adjacent



within



EBUS定位 及固定長度



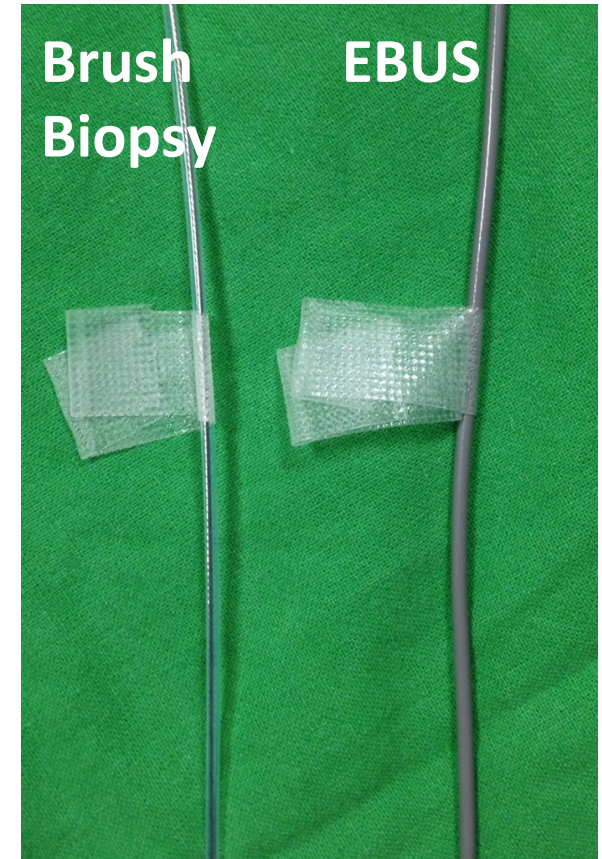
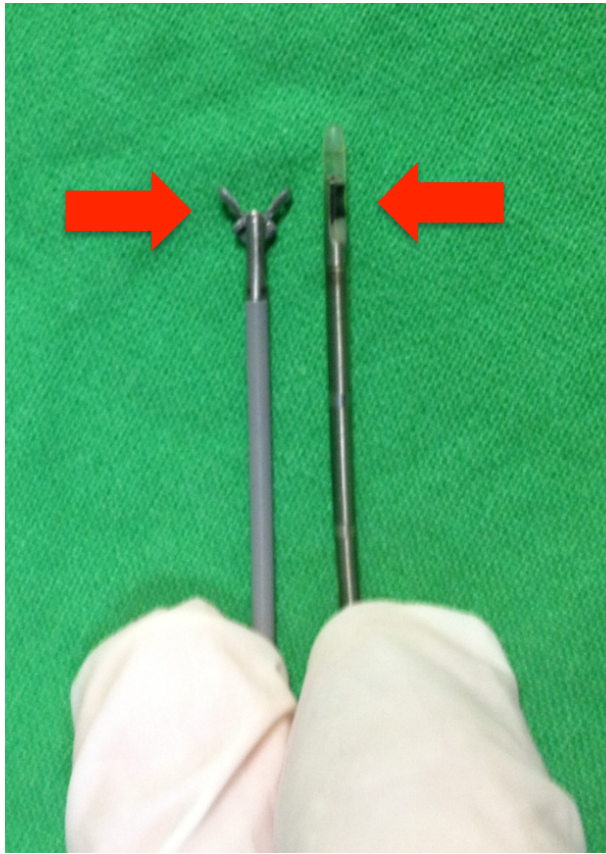
固定 EBUS 位置



固定 Biopsy 、Brush



Fix brush and forceps biopsy



執行Biopsy



Radial Probe EBUS for Peripheral Pulmonary Lesions

- Retrospective review of peripheral bronchoscopy cases in which radial probe EBUS
- January 2008 and December 2012
- 496 patients

Chen A, et al. Ann Am Thorac Soc. 2014 May;11(4):578



Radial Probe EBUS for Peripheral Pulmonary Lesions

Diagnostic yield by nodule size

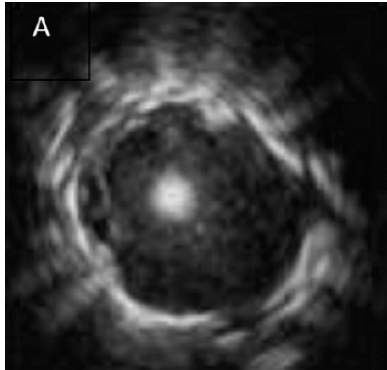
- A diagnosis was obtained in 321 of 467 patients (69%).

Yield	Nodule Size				
	1–2 cm	2.1–3 cm	3.1–4 cm	4.1–5 cm	>5 cm
Total (%)	144 (31)	137 (29)	70 (15)	47 (10)	40 (9)
Diagnostic (%)	83 (58)	99 (72)	54 (77)	41 (87)	35 (88)

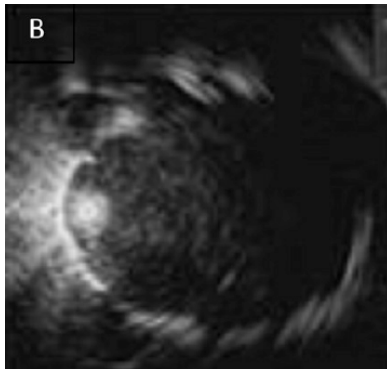
Chen A, et al. Ann Am Thorac Soc. 2014 May;11(4):578



Radial Probe EBUS for Peripheral Pulmonary Lesions



- **Concentric** : 63% (295/467).
- diagnostic yield : **84%** (248/295).



- **Eccentric** : 31% (147/467).
- diagnostic yield : **48%** (71/147).

Chen A, et al. Ann Am Thorac Soc. 2014 May;11(4):578



Radial Probe EBUS for Peripheral Pulmonary Lesions

Complications

- Pneumothorax : 2.8% (13/467) ◦
chest tube drainage in 54%
- Bleeding : 6
Greater than 300 ml : 2 patients. (340 ml and 350 ml)
100-300ml : 4 patients

Chen A, et al. Ann Am Thorac Soc. 2014 May;11(4):578



Outlines

Introduction of EBUS

EBUS 簡介

EBUS-GS 操作簡介



EBUS-Guide Sheath Procedure

EBUS 固定於sheath內

GS+EBUS 定位lesion

固定Guide sheath

執行Brush及 Biopsy

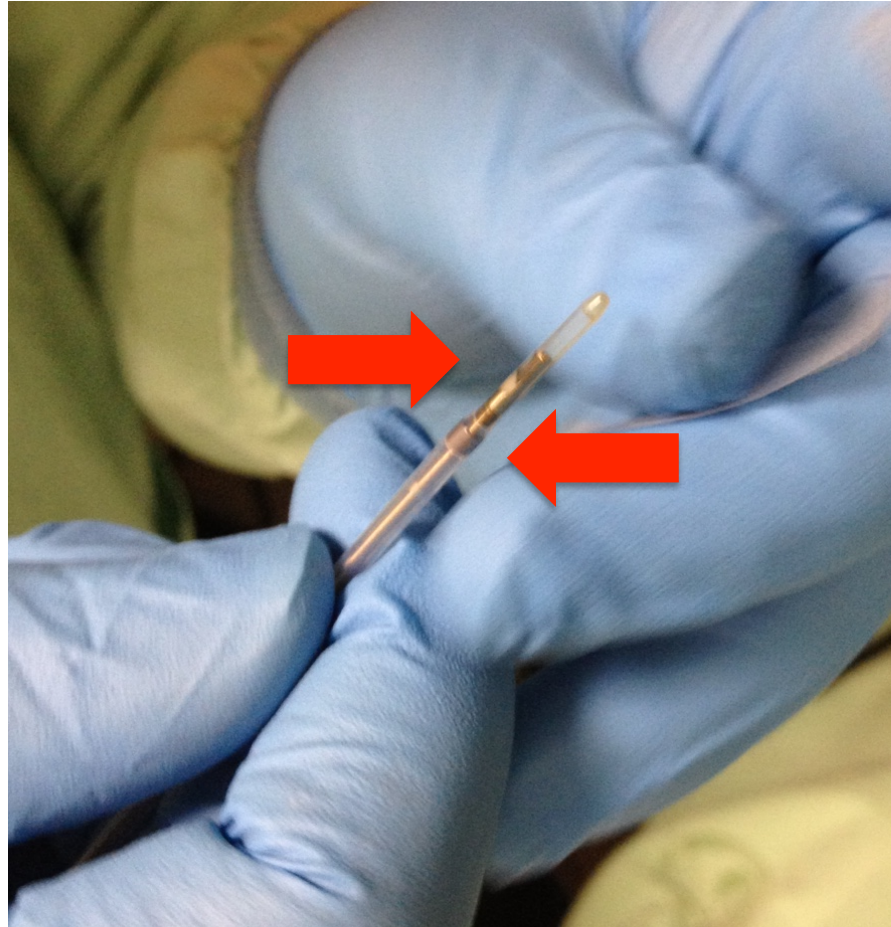
定位Brush 及 Biopsy



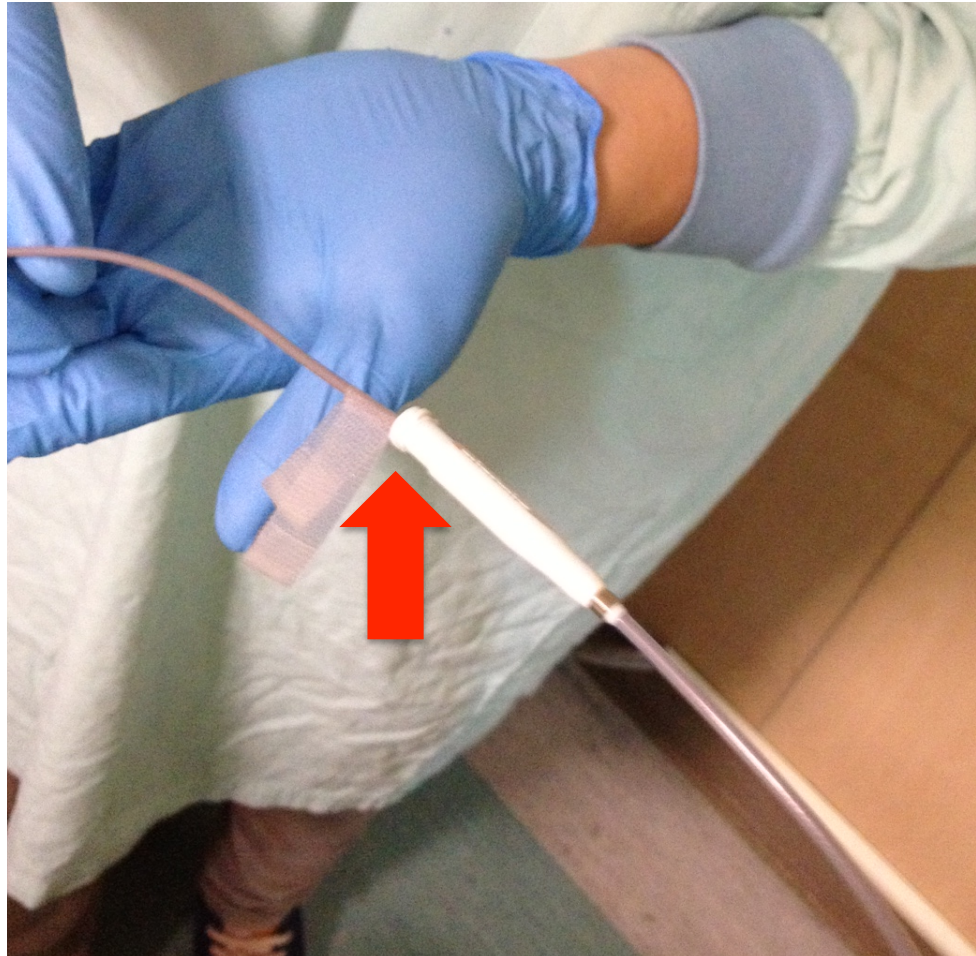
Fix EBUS in GS



Fix EBUS in GS



Fix EBUS in GS



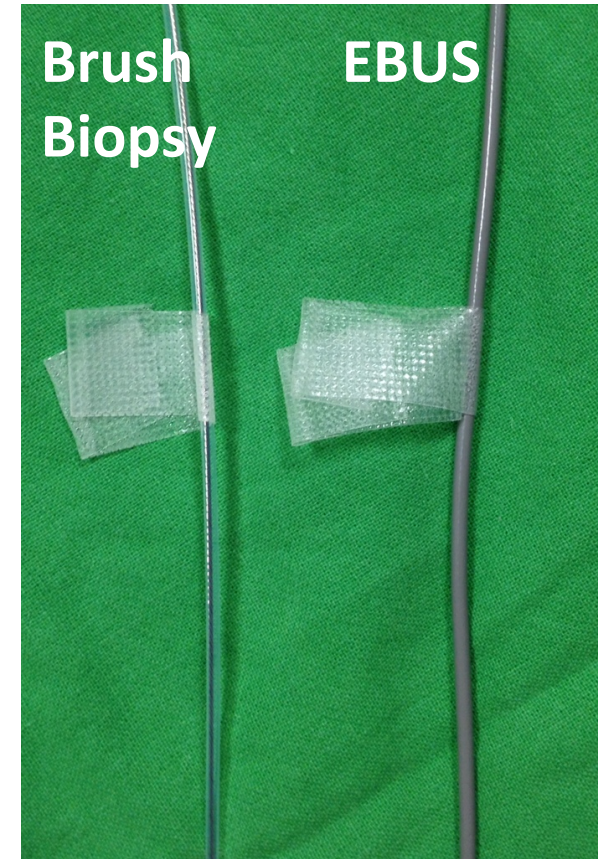
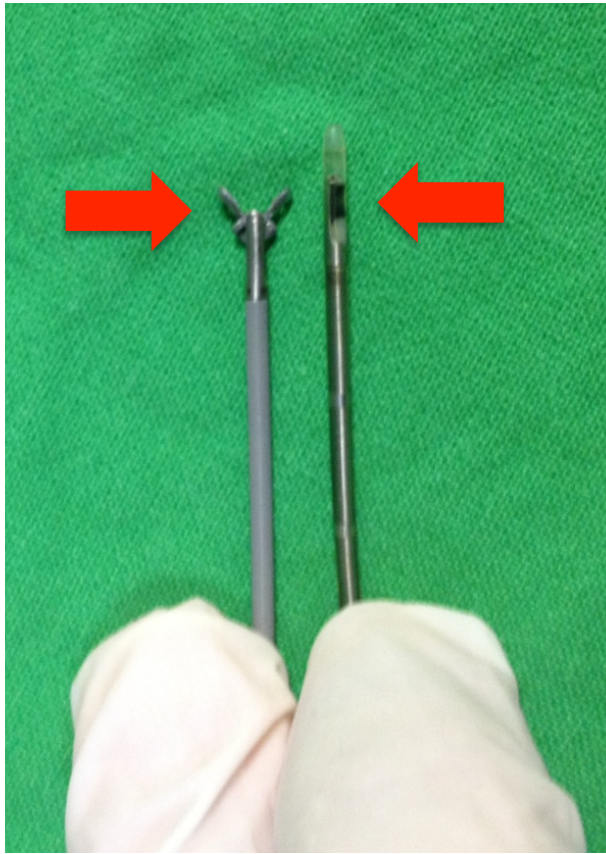
Fix Guide Sheath



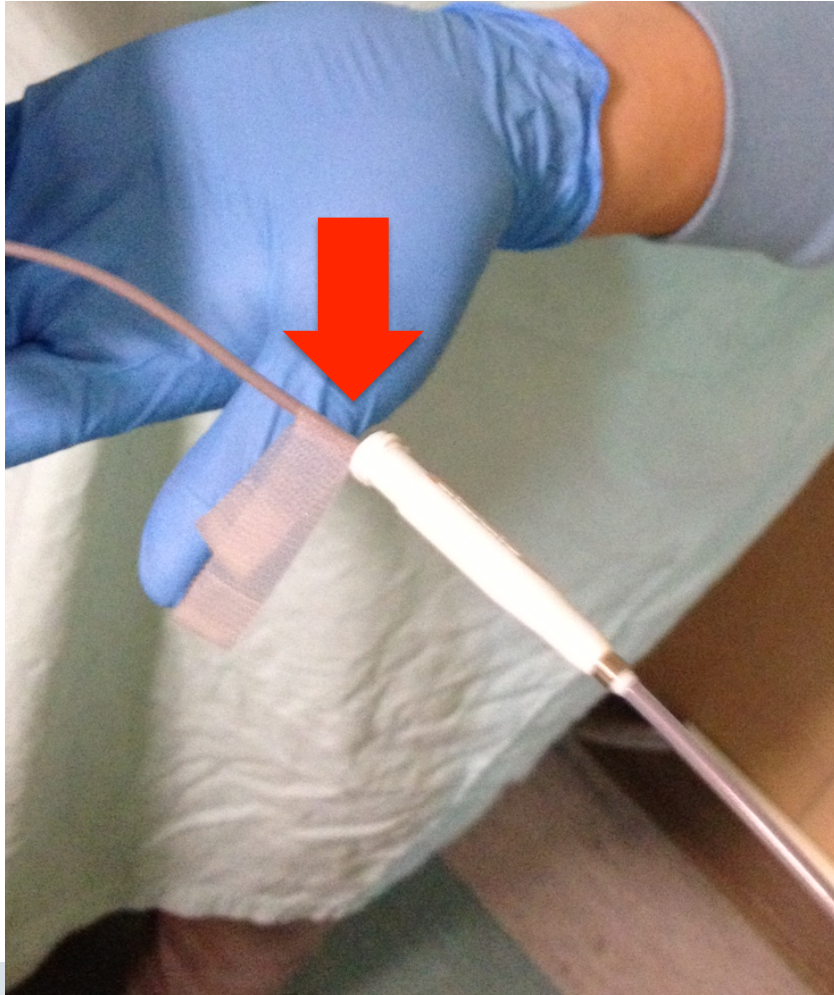
Fix Guide Sheath



Fix brush and forceps biopsy



Do Brush and Biopsy



Analysis of the Internal Structure by EBUS

- 124 patients with peripheral pulmonary lesions
- 69 patients, correlated with the histology of a surgical specimen
- Focusing on internal echoes, vascular and bronchial patency, and the morphology of the hyperechoic areas
 - reflecting air in the alveoli and bronchioles.

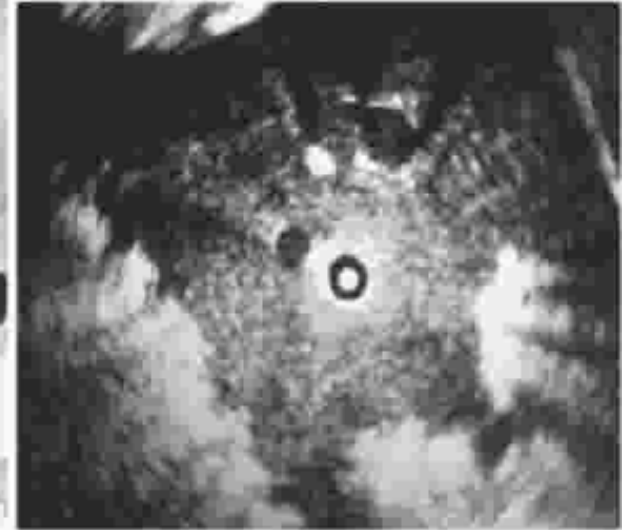
Kurimoto. Chest. 2002 Dec;122(6):1887



Analysis of the Internal Structure by EBUS

Type Ia lesion

Homogeneous Pattern
With Patent Vessels
and Patent
Bronchioles



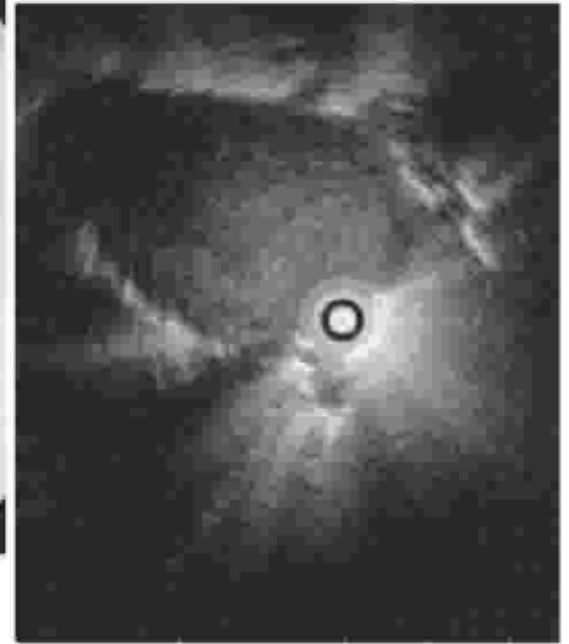
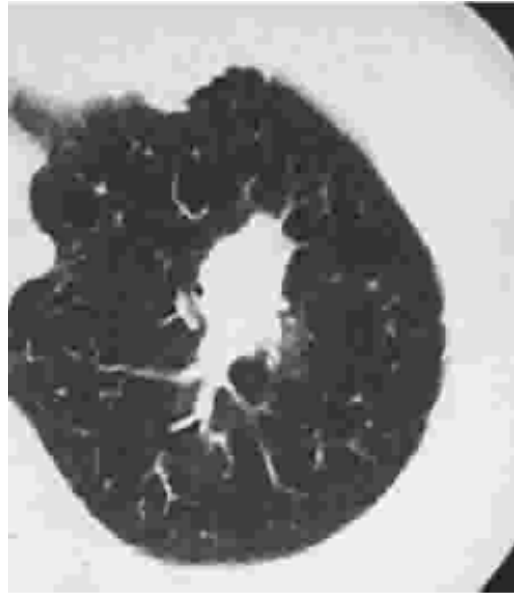
Kurimoto. Chest. 2002 Dec;122(6):1887



Analysis of the Internal Structure by EBUS

Type Ib lesion

Homogeneous Pattern
Without Vessels and
Bronchioles



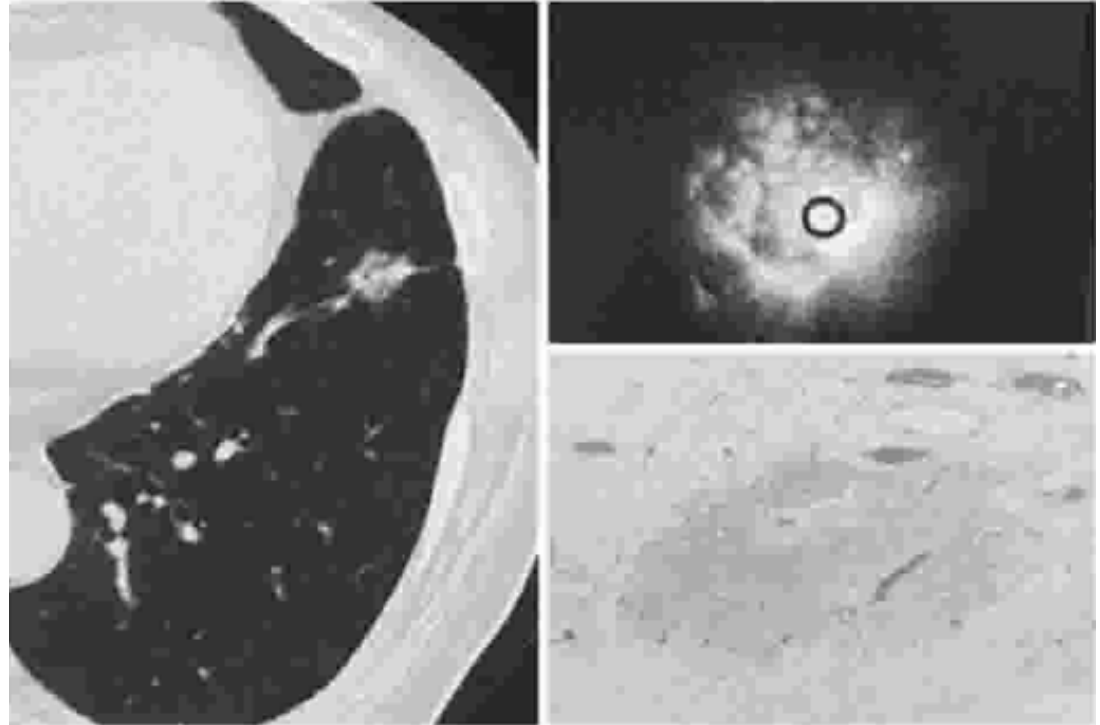
Kurimoto. Chest. 2002 Dec;122(6):1887



Analysis of the Internal Structure by EBUS

Type IIa lesion

Hyperechoic Dots and
Linear Arcs Without
Vessels



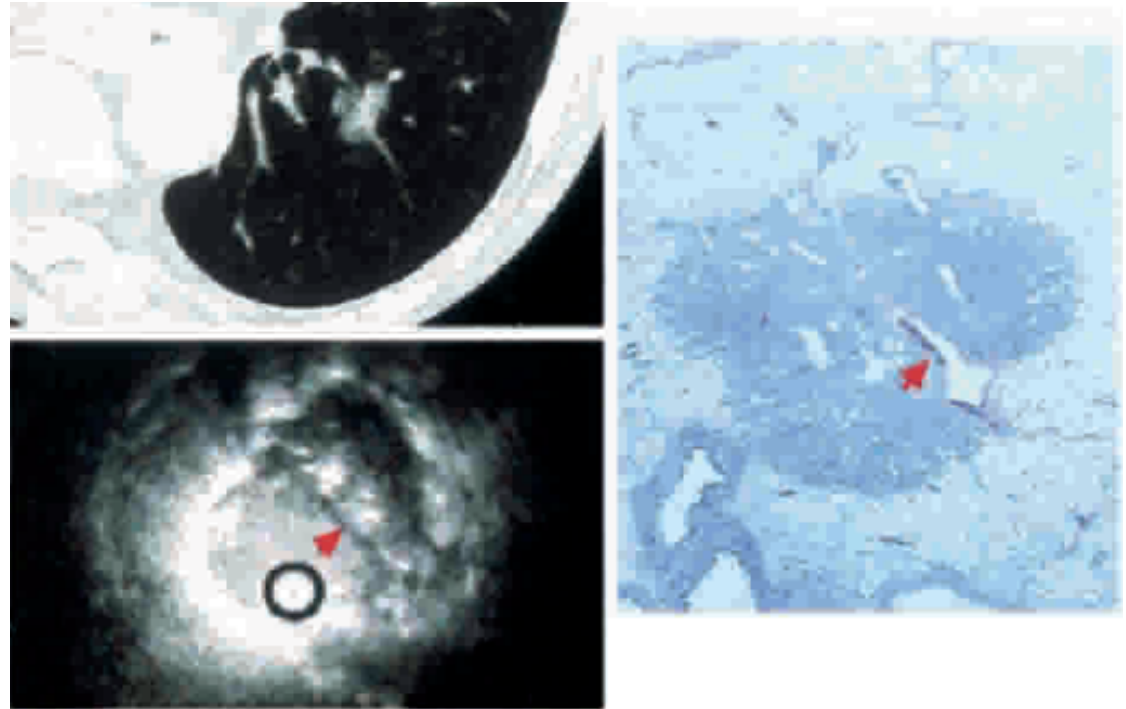
Kurimoto. Chest. 2002 Dec;122(6):1887



Analysis of the Internal Structure by EBUS

Type IIb lesion

Hyperechoic Dots
and Linear Arcs
With Patent Vessels



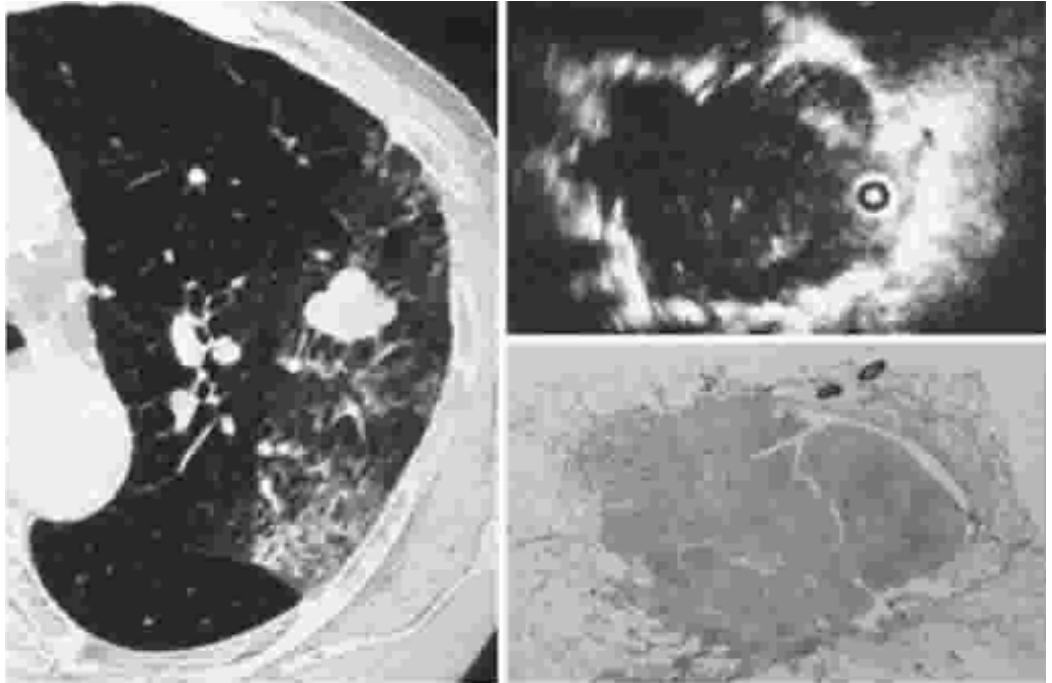
Kurimoto. Chest. 2002 Dec;122(6):1887



Analysis of the Internal Structure by EBUS

Type IIIa lesion

Heterogeneous Pattern
With Hyperechoic Dots
and Short Lines



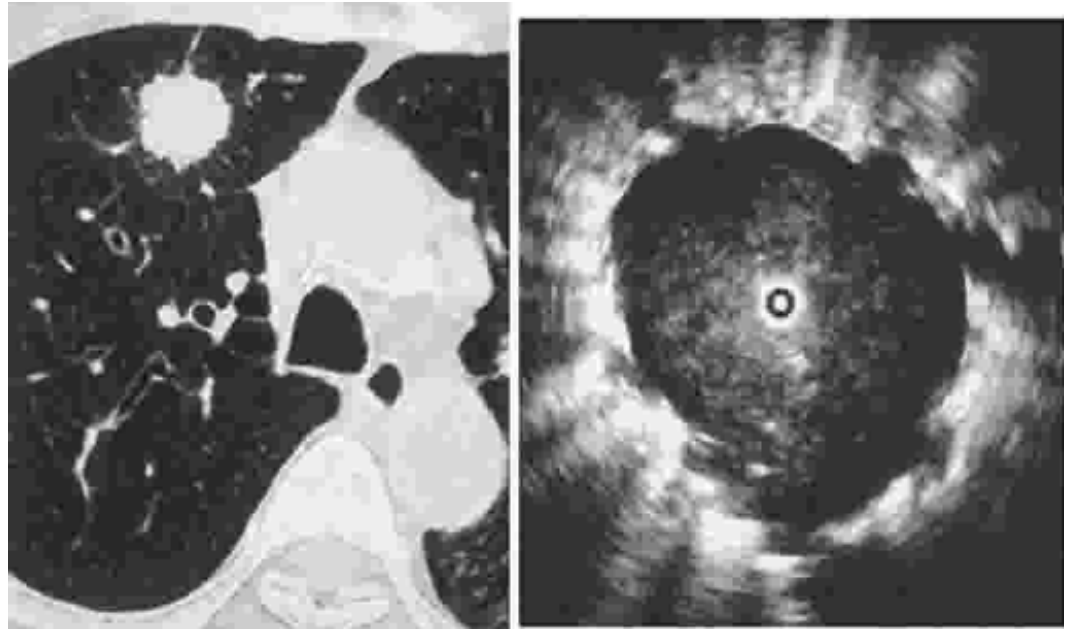
Kurimoto. Chest. 2002 Dec;122(6):1887



Analysis of the Internal Structure by EBUS

Type IIIb lesion

Heterogeneous Pattern
Without Hyperechoic
Dots and Short Lines



Kurimoto. Chest. 2002 Dec;122(6):1887



Analysis of the Internal Structure by EBUS

- 23 of 25 **type I** lesions (92.0%) were **benign**
- 98 of 99 **type II and III** lesions (99.0%) were **malignant**.
- 21 of 24 type II lesions (87.5%) were well-differentiated adenocarcinomas
- **All type IIIb** lesions were malignant, including 18 poorly differentiated adenocarcinomas (81.8%).

Kurimoto. Chest. 2002 Dec;122(6):1887



Any Questions ?

