How to perform TBLB using radial probe EBUS

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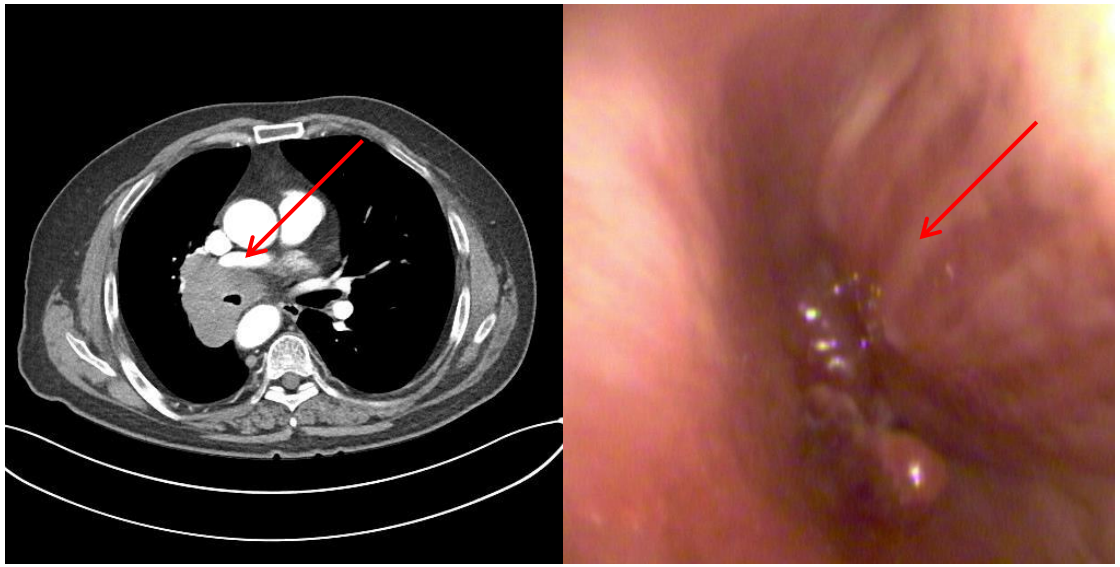
Trend of tumor location

In the past



Central tumor
Smoker male
Decreasing

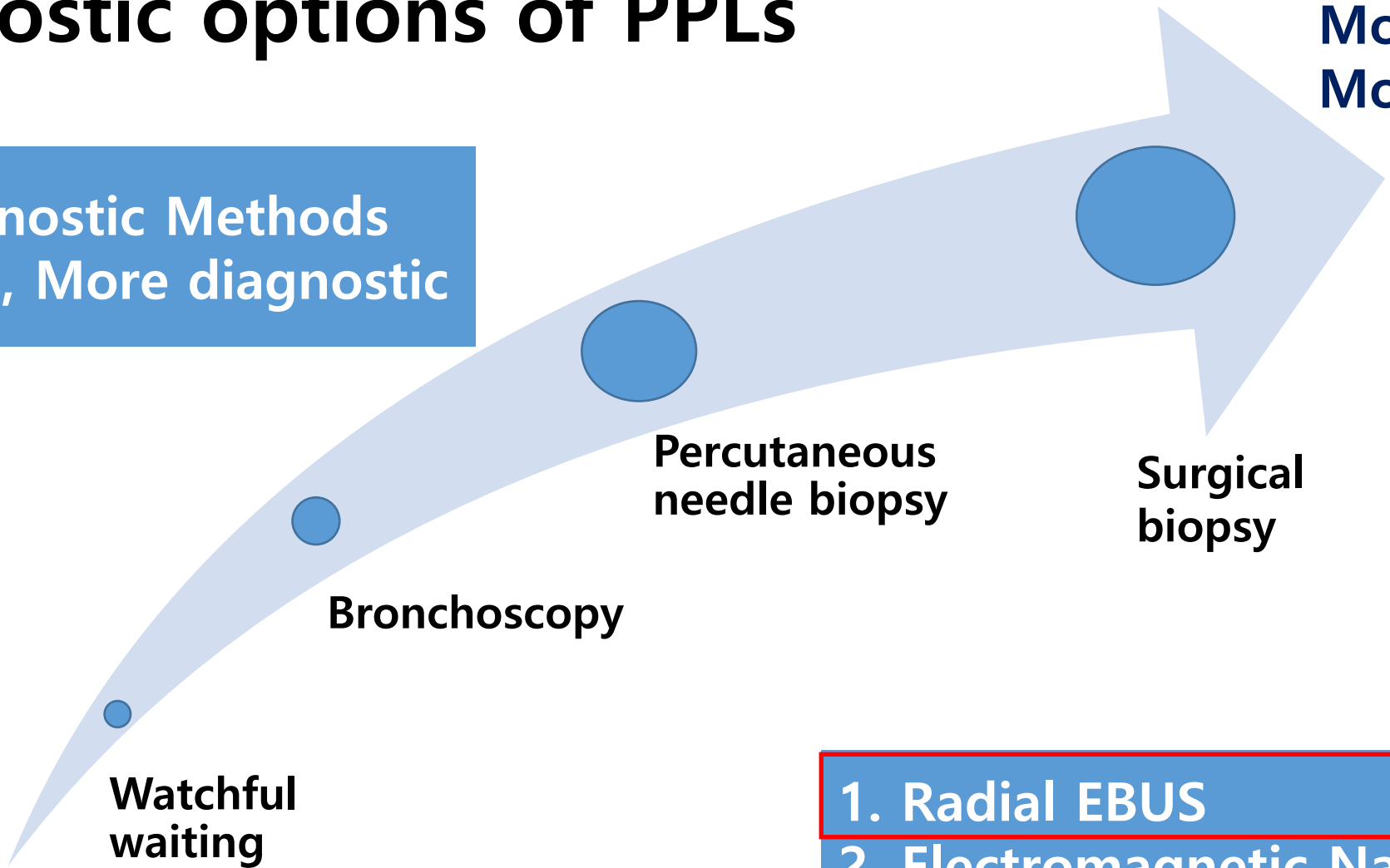
Recently

Peripheral tumor
Never-smoked female
Increasing

Diagnostic options of PPLs

Most invasive
Most diagnostic

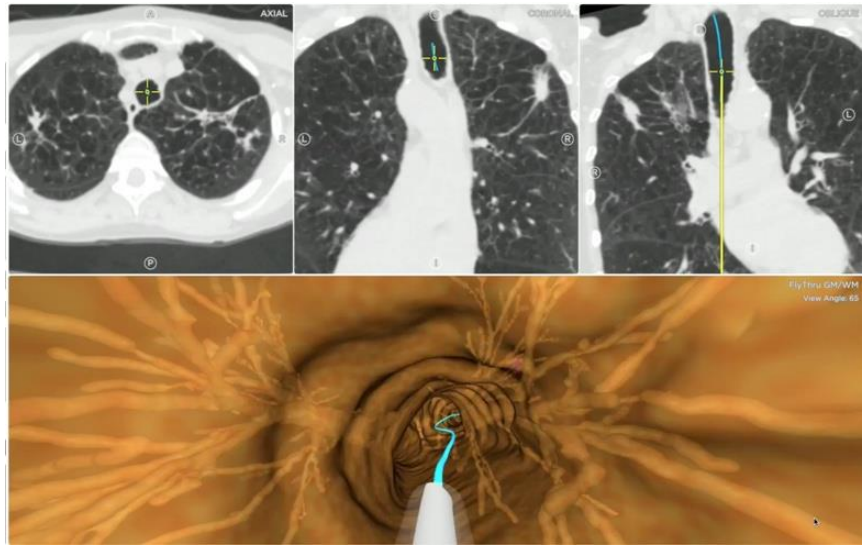
Ideal Diagnostic Methods
Less invasive, More diagnostic



Least invasive
Least diagnostic

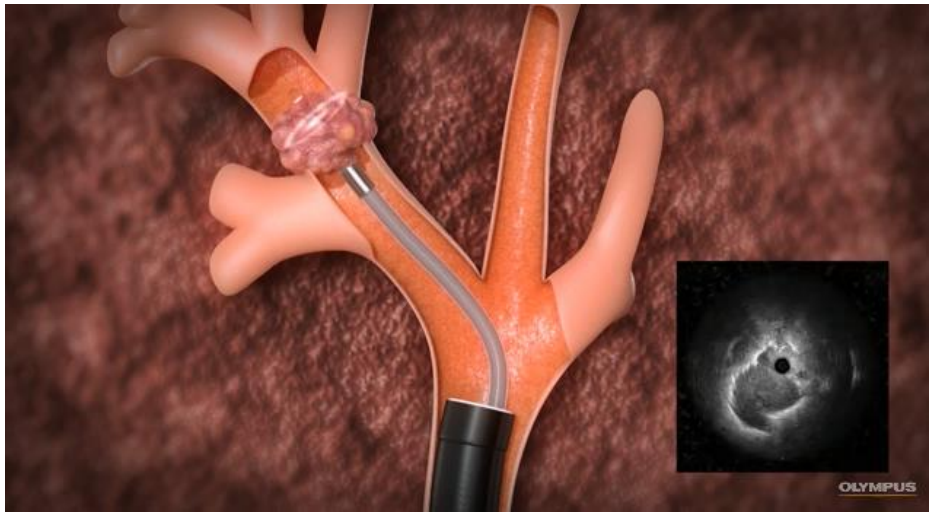
1. Radial EBUS
2. Electromagnetic Navigational Bronchoscopy (ENB)

ENB
(Electromagnetic Navigational Bronchoscopy)



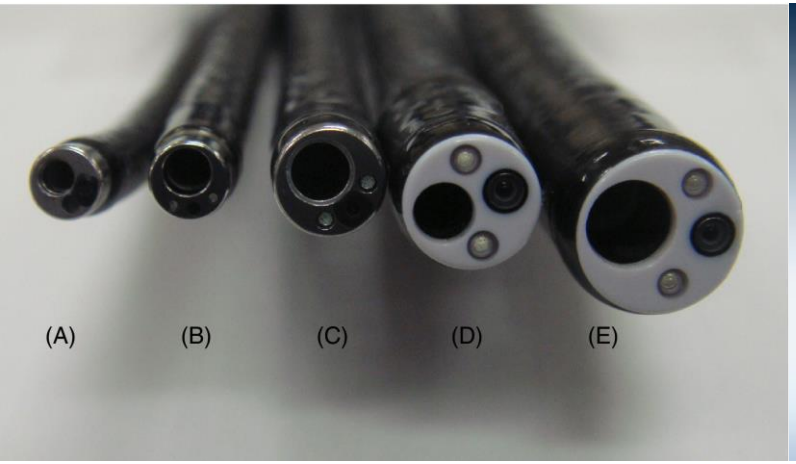
자동차 네비게이션 시스템

Radial Probe EBUS (RP-EBUS)



지도를 보고 목적지를 직접 찾음

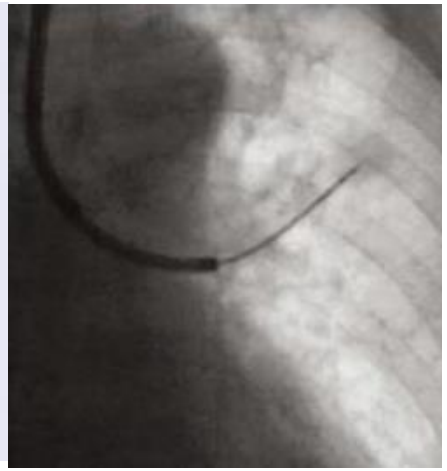
Radial EBUS guided TBLB



Thin bronchoscope

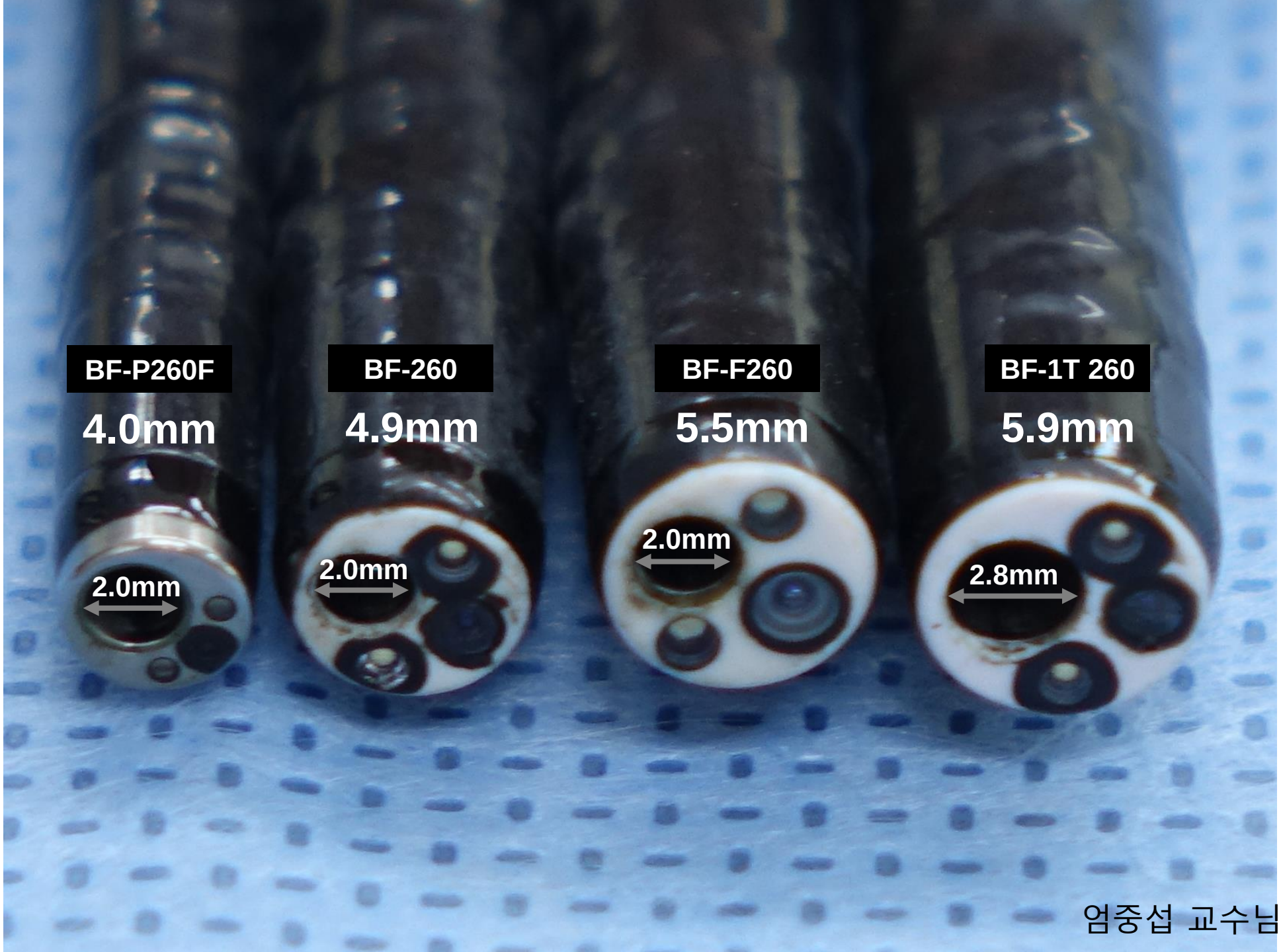
Radial EBUS

Guide Sheath Kit



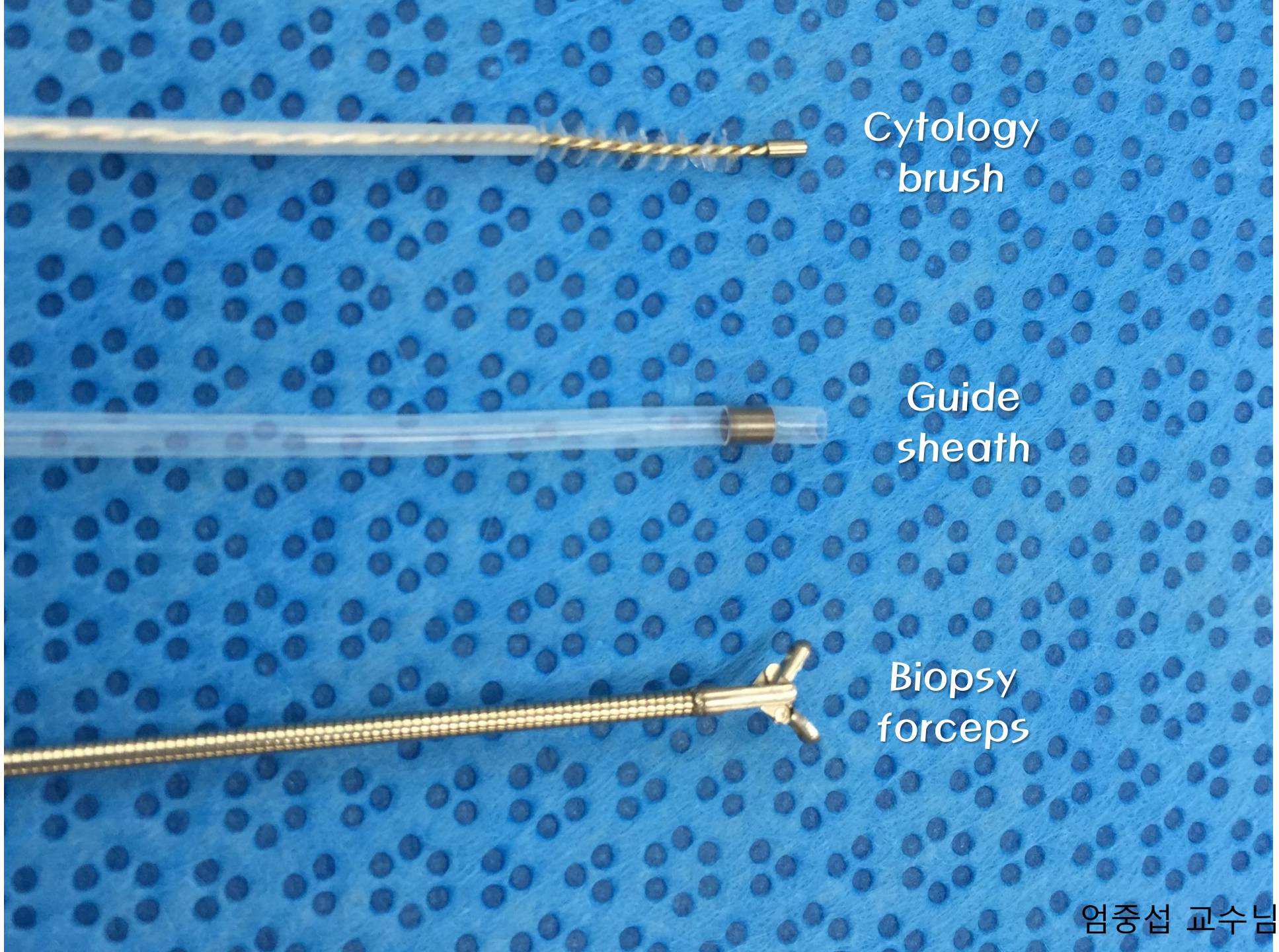
Fluoroscopy

Respirology 2020;25:914–923


BF-P260F
4.0mm
2.0mm
BF-260
4.9mm
2.0mm
BF-F260
5.5mm
2.0mm
BF-1T 260
5.9mm
2.8mm

엄중섭 교수님 슬라이드

엄중섭 교수님 슬라이드



엄중섭 교수님 슬라이드

Radial EBUS guided TBLB

1. Thin section chest CT reconstruction

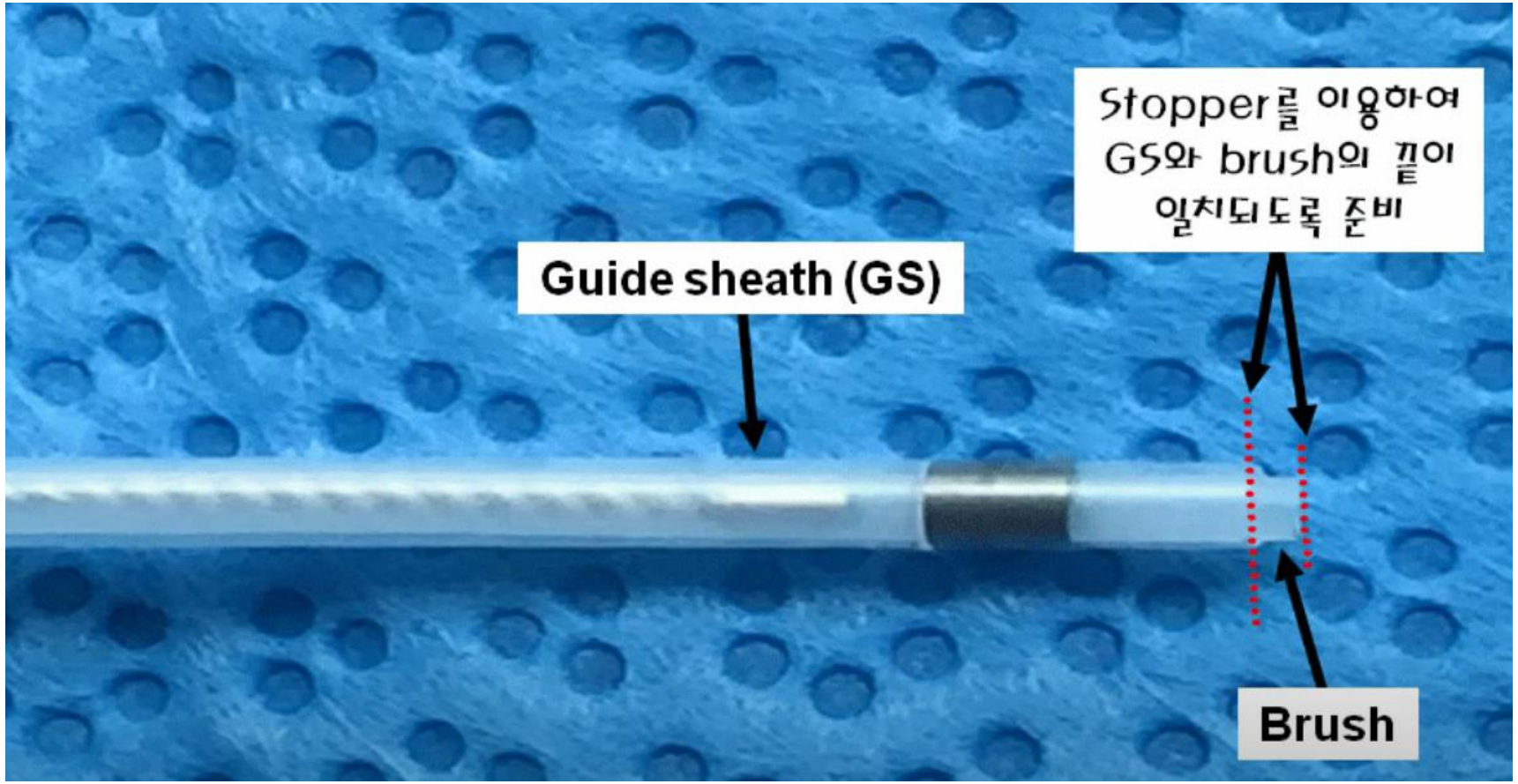
2. EBUS-GS preparation

3. Draw bronchial route to PPLs

4. Perform biopsy

EBUS-GS preparation

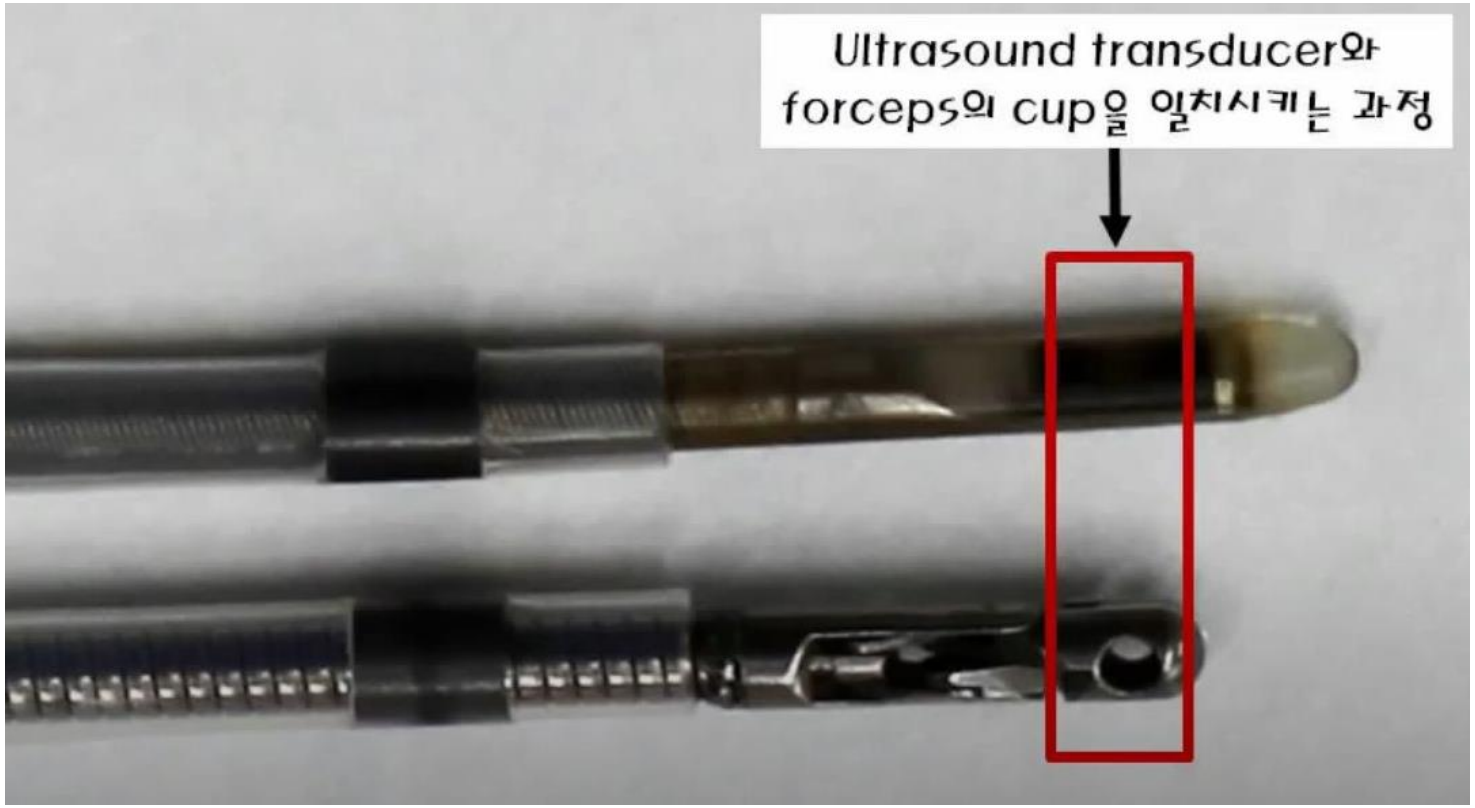
- Brush preparation



Youtube (Prof. Eom JS)

EBUS-GS preparation

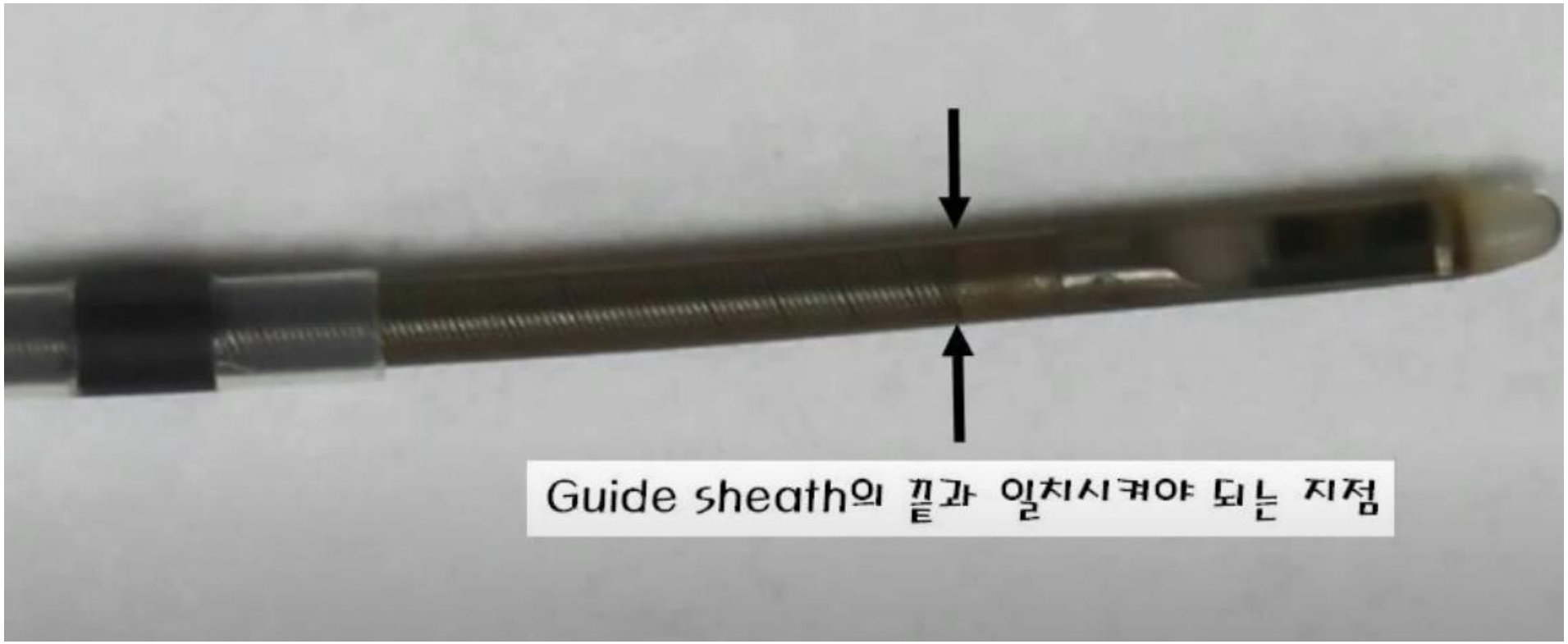
- Forcep preparation



Youtube (Prof. Eom JS)

EBUS-GS preparation

- RP-EBUS preparation

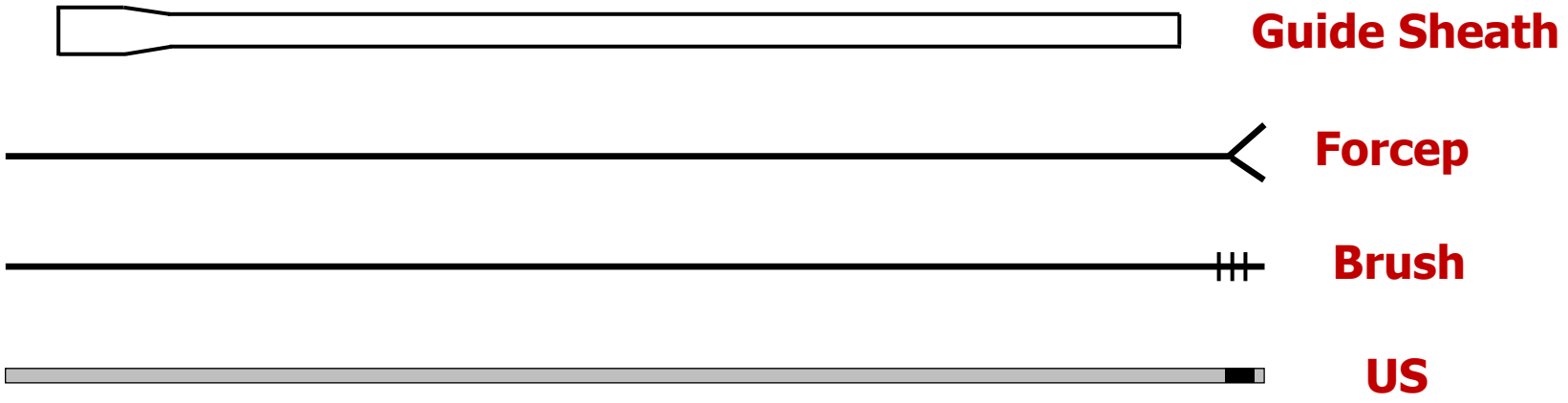


Youtube (Prof. Eom JS)

EBUS-GS preparation

Youtube (Prof. Eom JS)

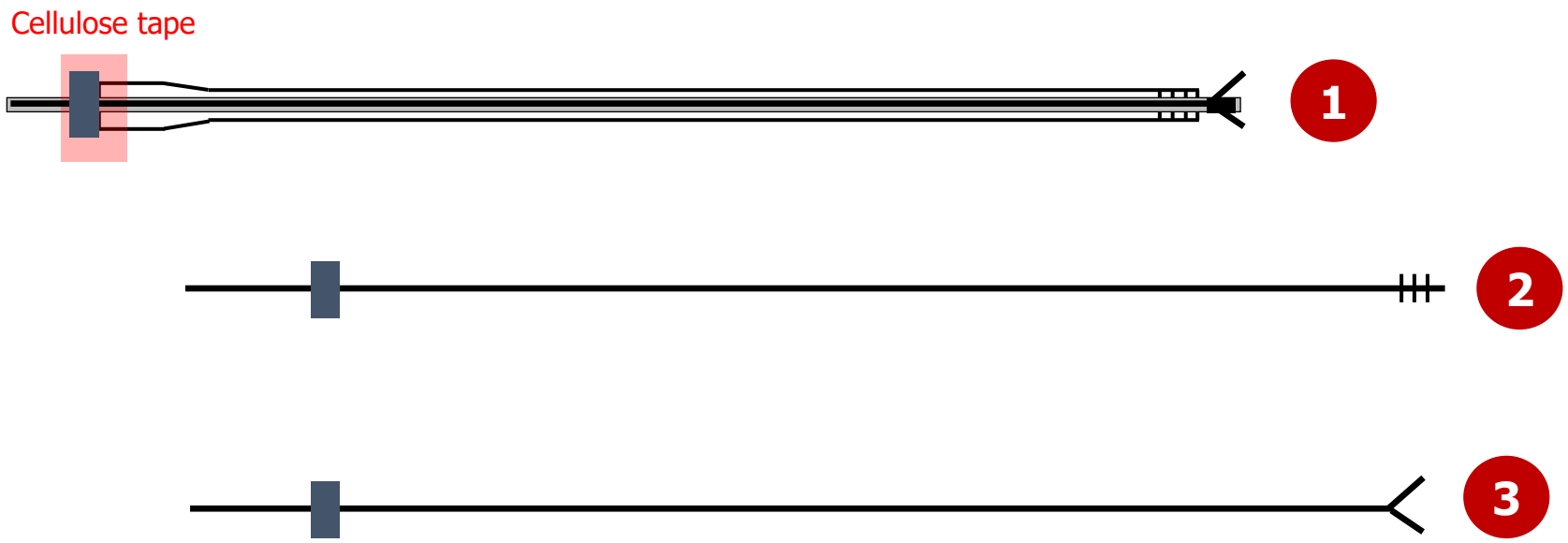
Kit Preparation (K-201)



stopper

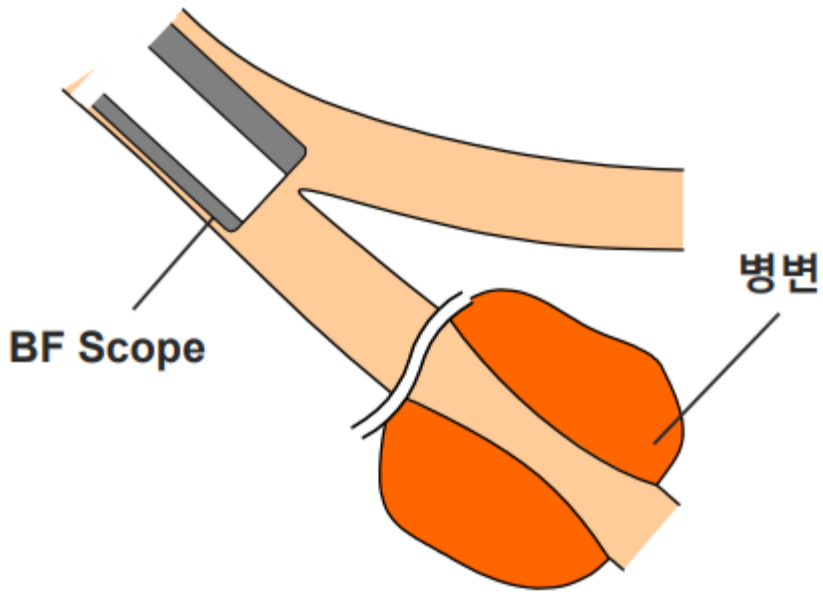
목정하 교수님 슬라이드

Kit Preparation (K-201)

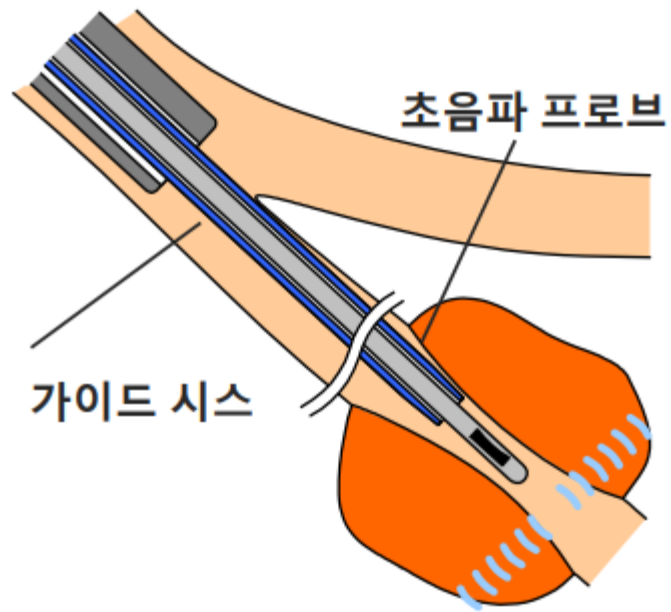


목정하 교수님 슬라이드

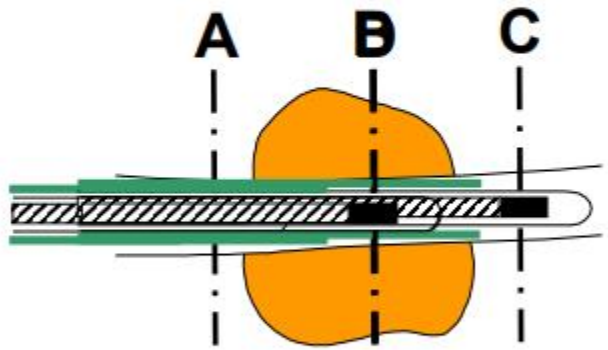
1. BF Scope를 병변 가까이 삽입합니다.



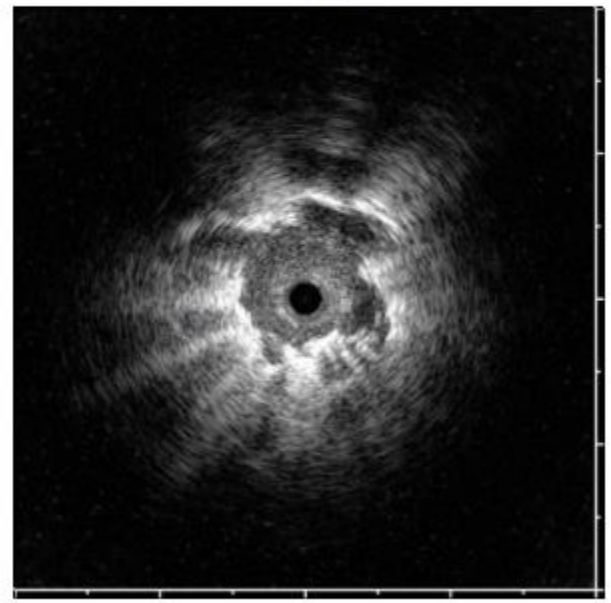
2. Scope channel에 가이드 시스를 삽입하고 가이드 시스 안에 초음파프로브를 삽입합니다.



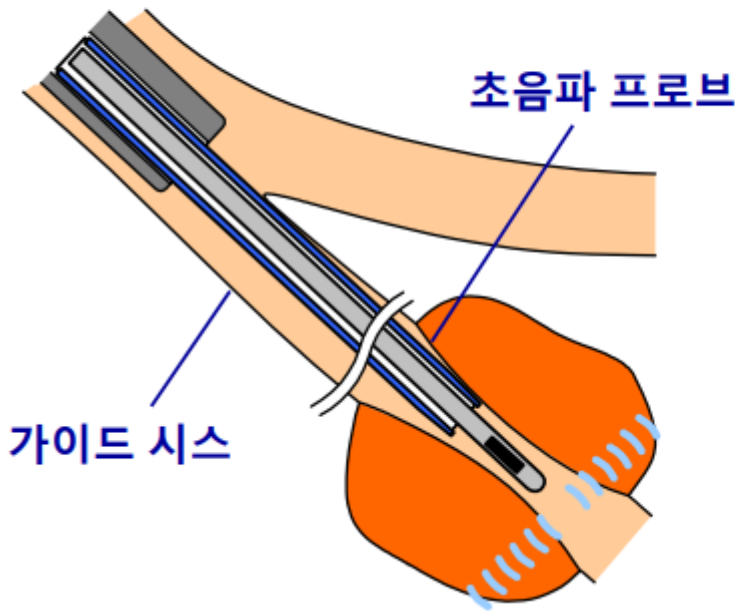
3. 초음파 프로브를 앞뒤로 움직이며 초음파상에 의한 병변부를 지정합니다.



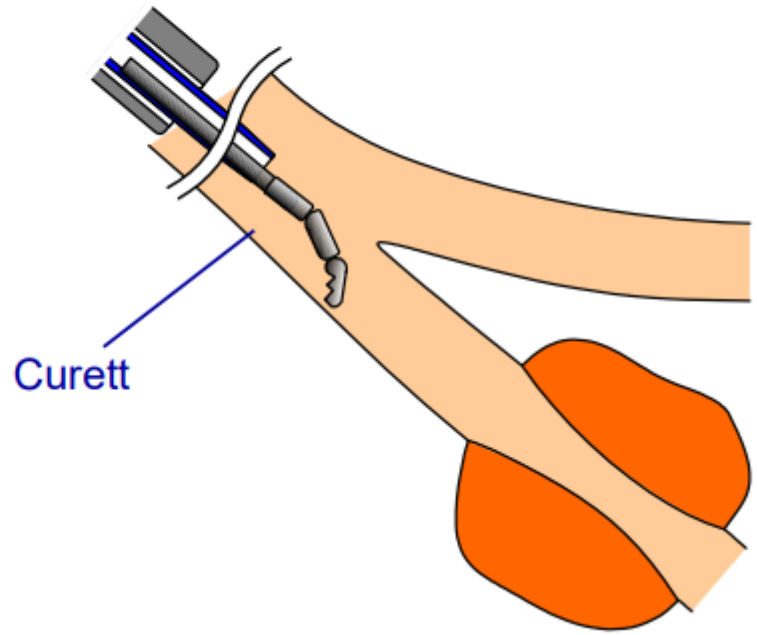
US image



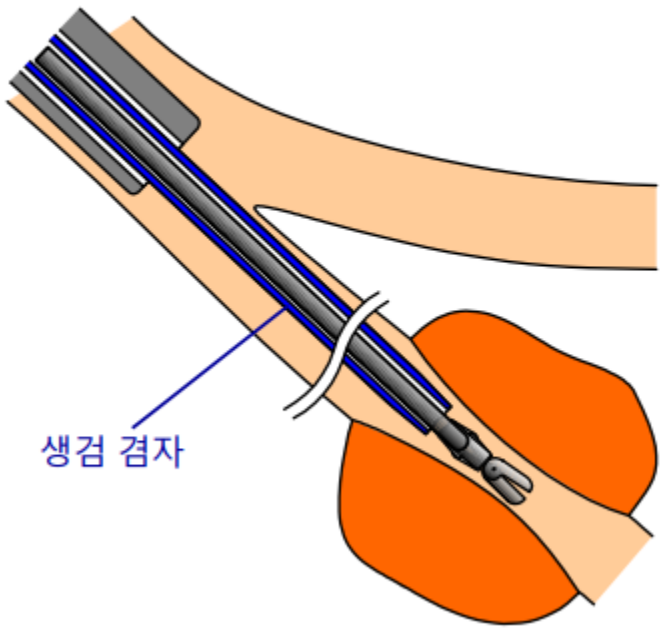
4. 가이드 시스를 병변부에 그대로 둔 상태에서 초음파 프로브만 제거합니다.

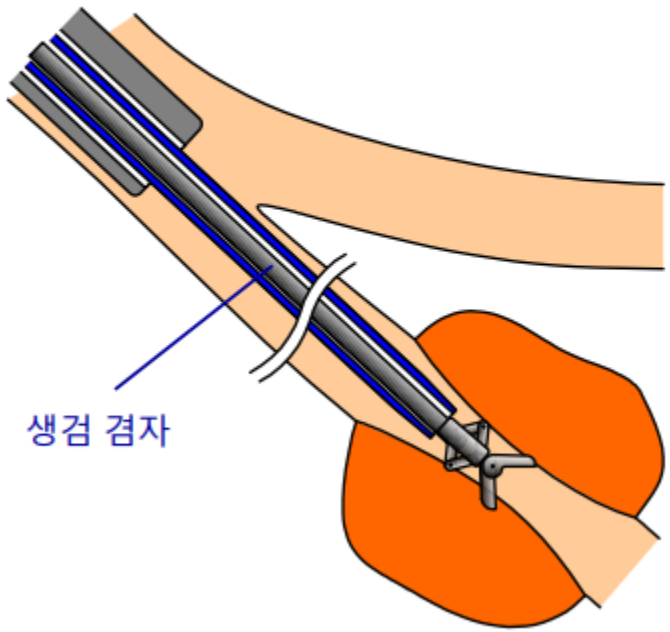


5. 삽입이 곤란한 부위에는 Curett을 사용해 가이드 시스를 삽입 · 유치를 진행합니다.



6. 생검 겸자 및 Cytology brush를 가이드 시스 안에 삽입하여 병변부의 샘플링을 진행합니다.





Guide Sheath Kit

Model Name		K-201	K-202	K-203	K-204
Compatible Channel Diameter		2.0mm		2.6mm	
Set Content	Guide Sheath	SG-200C	SG-200C	SG-201C	SG-201C
	Maximum outer diameter	1.95mm		2.55mm	
	Working length	1050mm			
	Biopsy Forceps	FB-233D	FB-233D	FB-231D	FB-231D
	Maximum outer diameter	1.5mm		1.9mm	
	Working length	1150mm			
	Cup configuration	Standard, fenestrated			
	Cytology Brush	BC-204D-2010	-	BC-202D-2010	-
	Maximum outer diameter	1.4mm		1.8mm	
	Working length	1150mm			
	Brush diameter	2.0mm			
	Brush length	10mm			
	ET Stopper	3 pcs (white)		3 pcs (2 pcs: gray / 1 pc: white)	
	US Stopper	1 pc (white)		1 pc (gray)	

Biopsy using GS (guide sheath)

- Advantages
  - **Repeated sampling** from the same region
  - **Protects against bleeding** from the biopsy site by wedging the GS into the bronchial lumen

- Disadvantages
  - **Small specimens** using small forceps
    - 1.5mm forceps (with GS) vs. 1.9mm forceps (without GS)

Bronchoscopes and sampling instruments

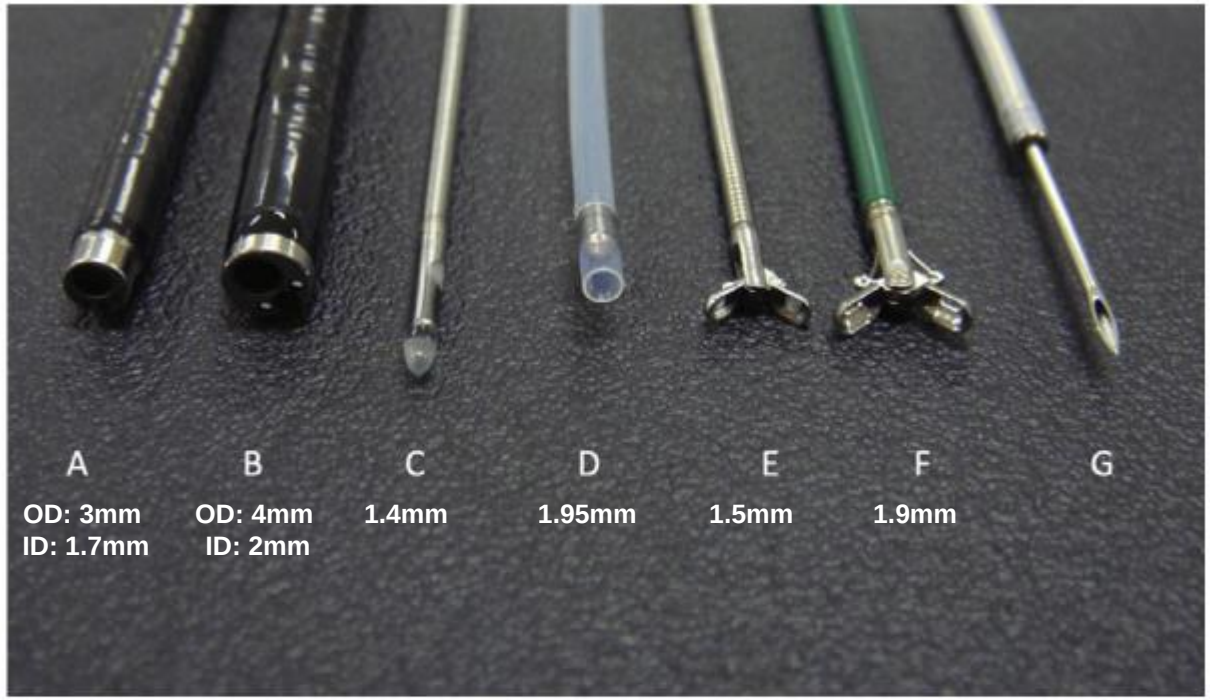


Figure 1 – *Bronchoscopes and sampling instruments: a 3.0-mm ultra-thin bronchoscope with a 1.7-mm working channel (marker A); a 4.0-mm thin bronchoscope with a 2.0-mm working channel (marker B); the 1.4-mm-diameter, radial, endobronchial ultrasound probe (marker C); the guide sheath (marker D); the 1.5-mm biopsy forceps (marker E); the 1.9-mm standard-sized biopsy forceps (marker F); and the 21-gauge needle (marker G).*

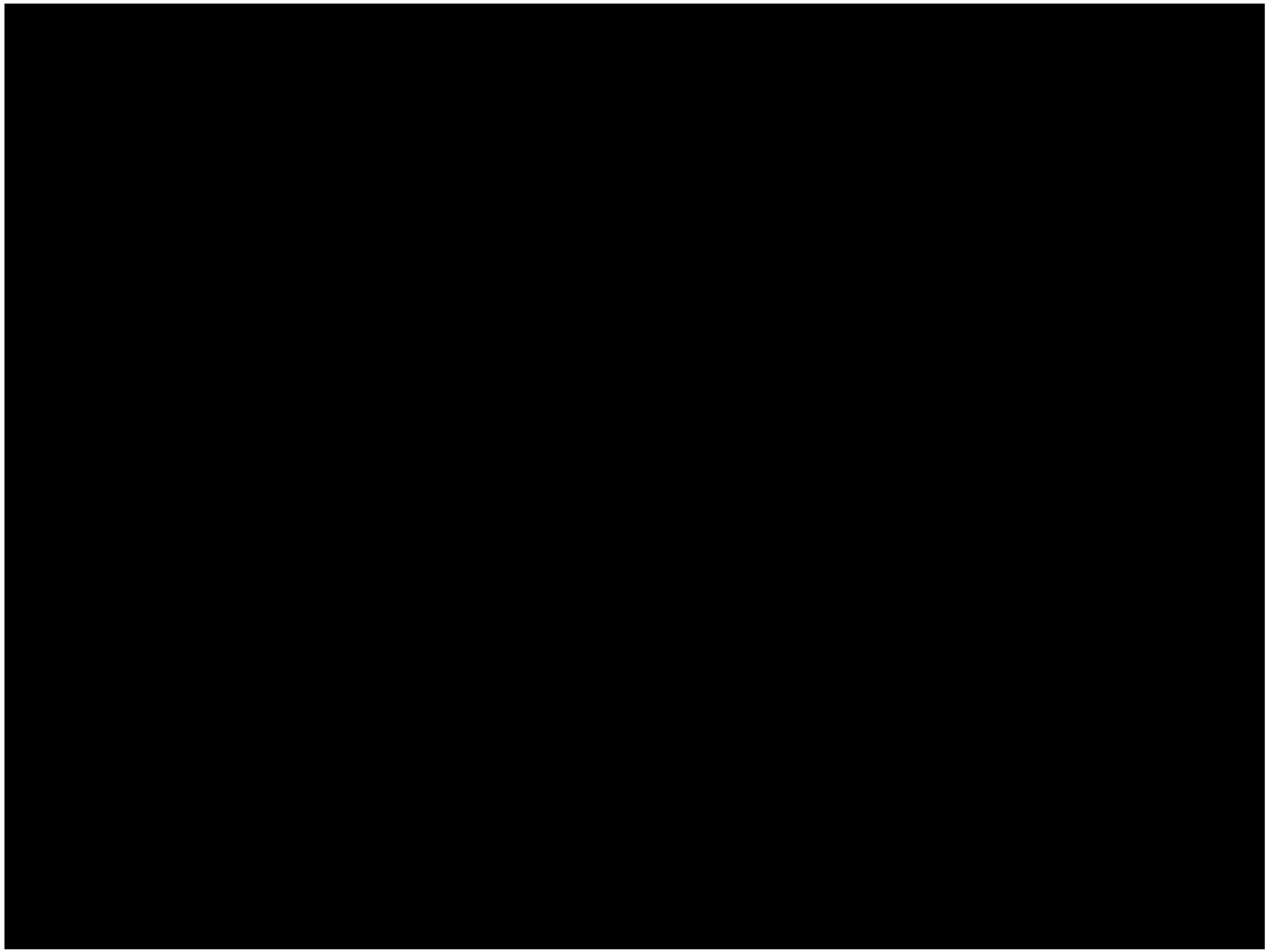
CHEST 2019; 156(5):954-964

Biopsy using fluoroscopy

- Advantages
  - **Visual feedback** to the operator
    - Precise guidance during biopsy
    - Check if a forcep is open during biopsy
  - **Improve diagnostic yield**

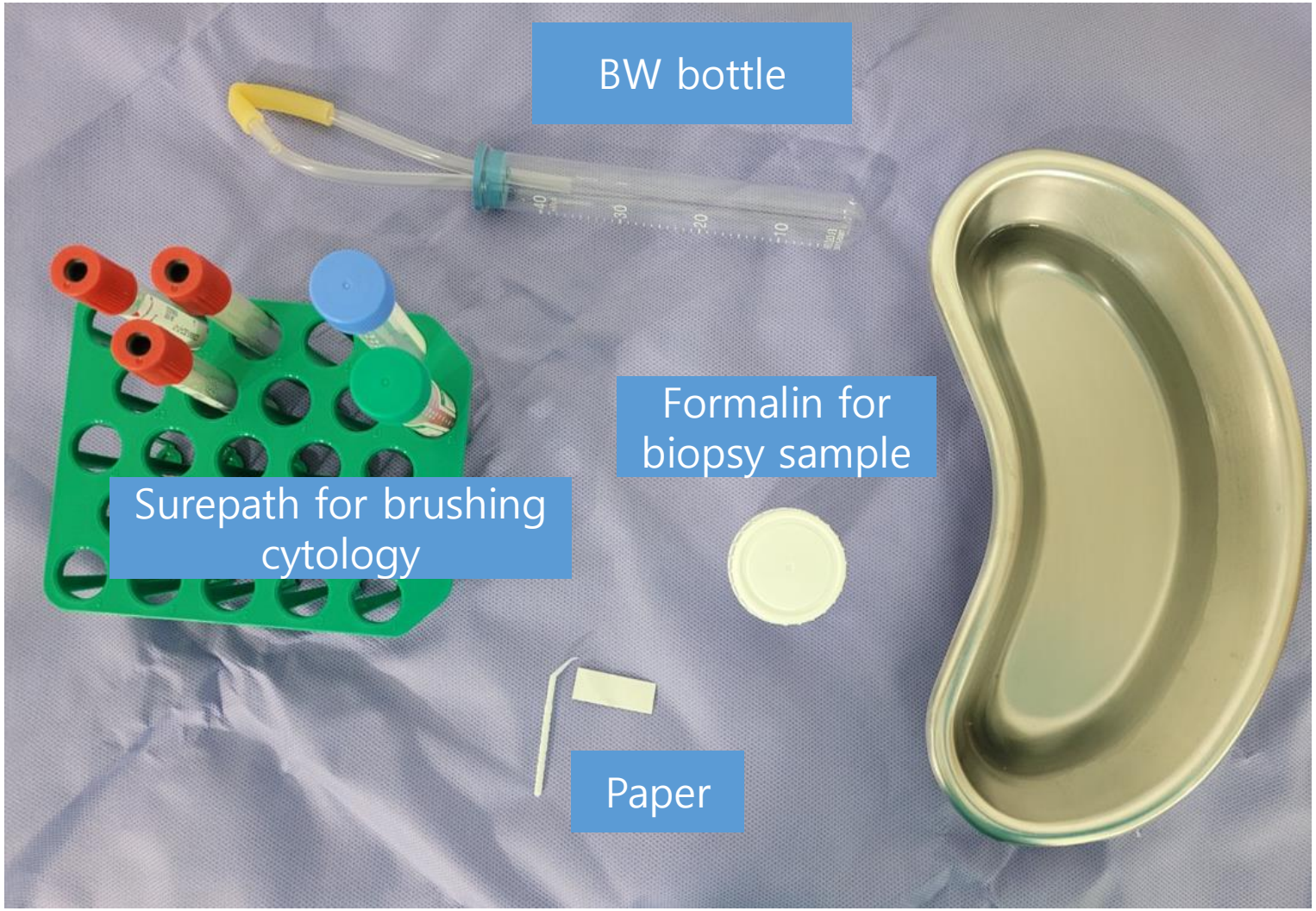
- Disadvantages
  - **Exposure to radiation**
  - **Additional** space, manpower, and **costs** (shield room)

Jabbing



Jabbing guide sheath to open biopsy forceps 엄중섭 교수님 슬라이드

Sample processing



Ultrathin bronchoscope (BF-MP290F)

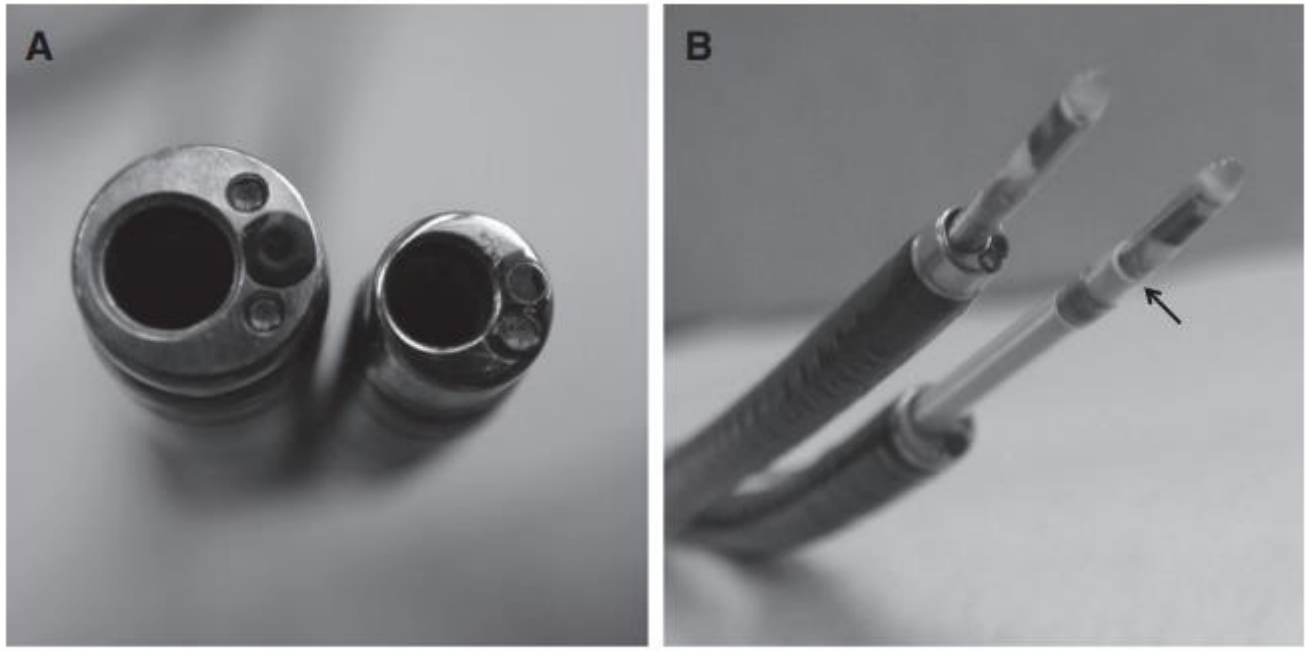


Figure 3. A comparison of bronchoscopes. (*A*) The 4.0-mm thin bronchoscope with a 2.0-mm working channel (*left*), and the 3.0-mm ultrathin bronchoscope with a 1.7-mm working channel (*right*). (*B*) A 3.0-mm ultrathin bronchoscope with a 1.4-mm ultrasonic probe (*left*), and a 4.0-mm bronchoscope with a 1.95-mm guide sheath (*arrow*) and a 1.4-mm ultrasonic probe (*right*).

Am J Respir Crit Care Med. 2015 Aug 15;192(4):468-76

UTB (Wider angulation range)

ORIGINAL ARTICLE

Ultrathin Bronchoscopy with Multimodal Devices for Peripheral Pulmonary Lesions

A Randomized Trial

Masahide Oki[1], Hideo Saka[1], Masahiko Ando[2], Fumihiro Asano[3], Noriaki Kurimoto[4], Katsuhiko Morita[5], Chiyoe Kitagawa[1], Yoshihito Kogure[1], and Teruomi Miyazawa[6]

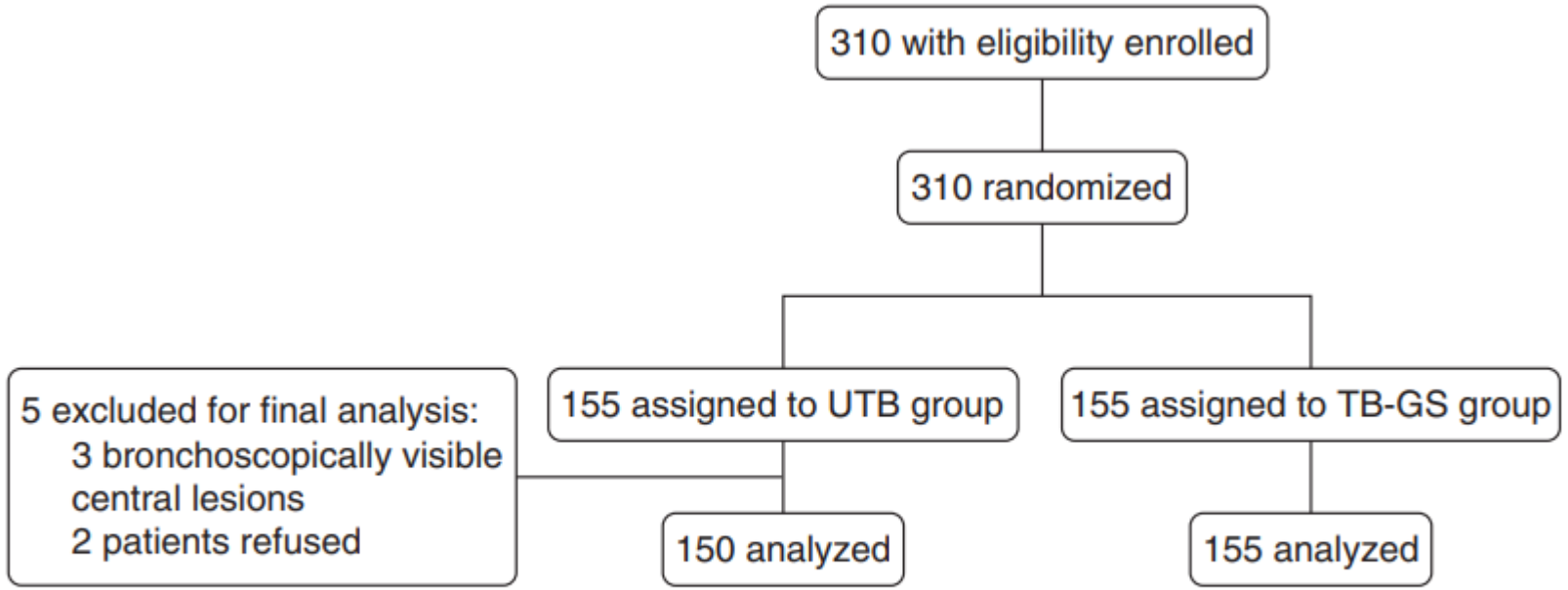


Figure 4. The flow of patients enrolled in the study. TB-GS = thin bronchoscopy with a guide sheath; UTB = ultrathin bronchoscopy.

Am J Respir Crit Care Med. 2015 Aug 15;192(4):468-76

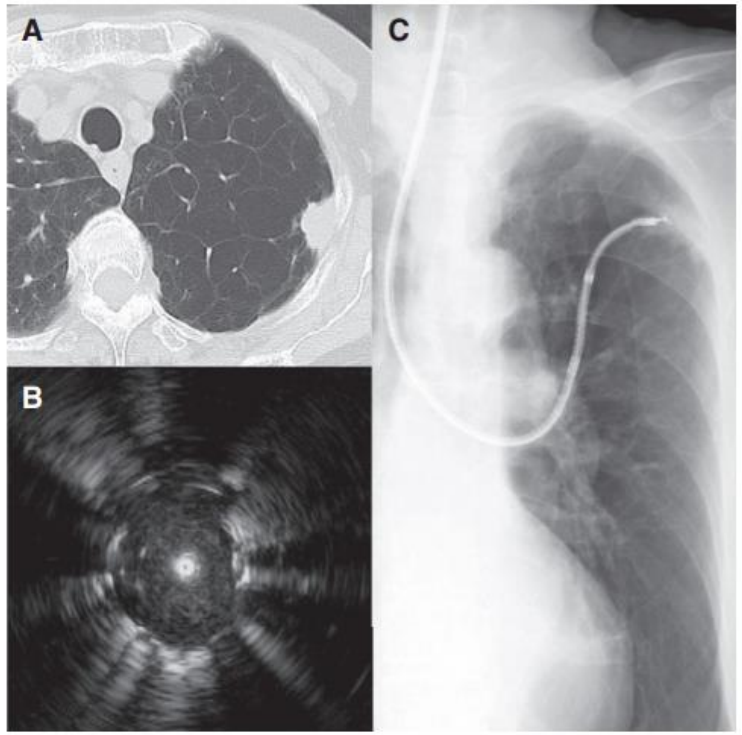


Figure 1. Computed tomographic image (*A*), ultrasonic image (*B*), and fluoroscopic image of transbronchial biopsy using an ultrathin bronchoscope (*C*) of a lung cancer (adenocarcinoma) examined and diagnosed with the ultrathin bronchoscopic method.

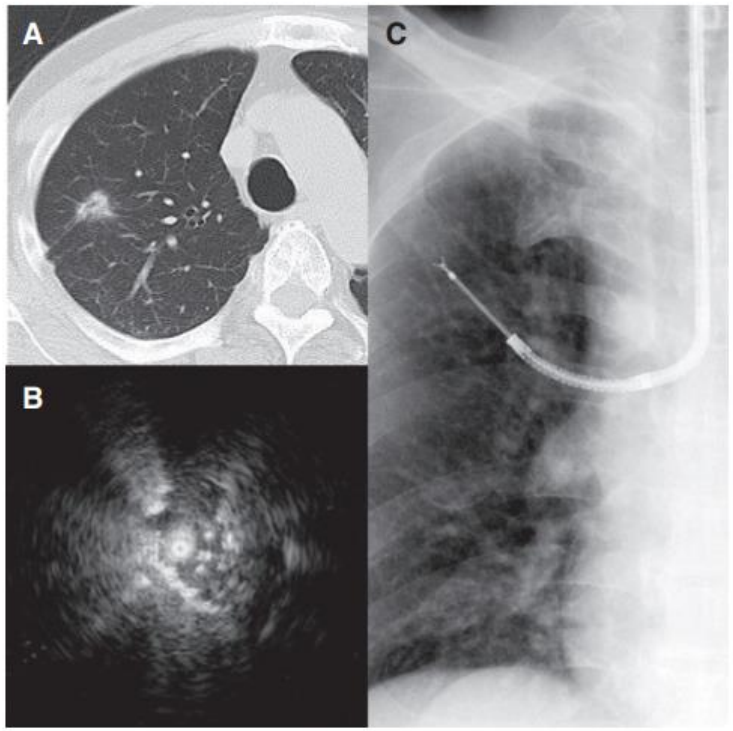


Figure 2. Computed tomographic image (*A*), ultrasonic image (*B*), and fluoroscopic image of transbronchial biopsy using a guide sheath (*C*) of a lung cancer (adenocarcinoma) examined and diagnosed by thin bronchoscopy with a guide sheath method.

Am J Respir Crit Care Med. 2015 Aug 15;192(4):468-76

경청해 주셔서 감사합니다