Part 3A: Endobronchial Biopsy volume 1

Strategy and Planning

Execution

Bronchoscopy International

When to perform endobronchial biopsy

- Visible airway mucosal abnormalities
- Visible airway nodules or masses
- In case of suspected sarcoidosis (even if airway mucosa appears normal)
- In case of abnormal autofluorescence to diagnose intraepithelial lesions (dysplasia, metaplasia, carcinoma in-situ)

Training is essential in order to

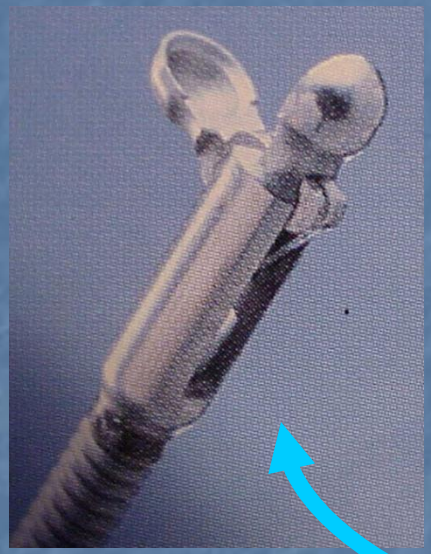
- Learn proper techniques and indications
- Avoid procedure-related complications.
- Learn to protect the equipment and the patient
  - To obtain adequate tissue for diagnosis
  - To avoid damaging the working channel
  - To avoid excess patient discomfort (cough, anxiety, shortness of breath).
  - To avoid bleeding, that might also prompt cough and patient agitation.

Endobronchial Biopsy

- Indications
  - Visible intraluminal or mucosal abnormality
  - Suspected Sarcoidosis (even if mucosa appears normal)
  - Early lung cancer detection (based on findings of autofluorescence and other imaging modalities)

Biopsy instruments

- Small reduction in bleeding using hot forceps: 39 patients with 6 biopsies each (Eur Respir J 2007; 29:108-111



Forceps with spike can be used to anchor forceps on lesion.

Open cup

Alligator (serrated)

Examples of biopsy forceps

Serrated forceps and cup forceps

Cup forceps with central tooth

Forceps may be single use or reusable

Endobronchial biopsy: Electrocautery forceps can be useful

- Hot biopsy forceps in the diagnosis of endobronchial lesions
  - 39 patients with 6 biopsies each (hot and cold)
  - Pathologic concordance between hot and cold biopsies was 92.5% and 87% (2 pathologists)
  - Small reduction in mild bleeding episodes with hot forceps (at 40-60-80-100 W)
  - Authors: routine use not warranted – can use as cold with set up for EC if significant bleeding occurs

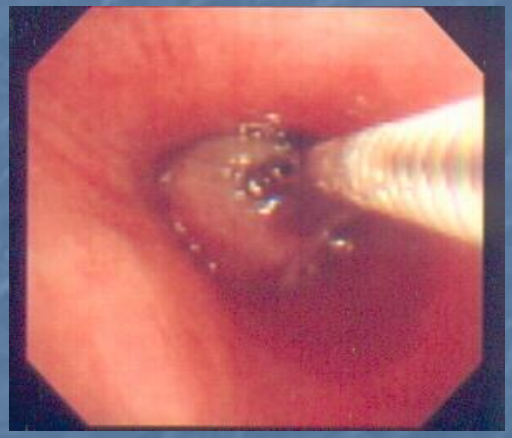
(from Olympus America)

Eur Respir J 2007; 29:108-111

Biopsy techniques

- Engage as much tissue as possible
- Keep scope as close to target tissue as possible
- May feel tugging sensation as forceps retracted

Approach



Open forceps

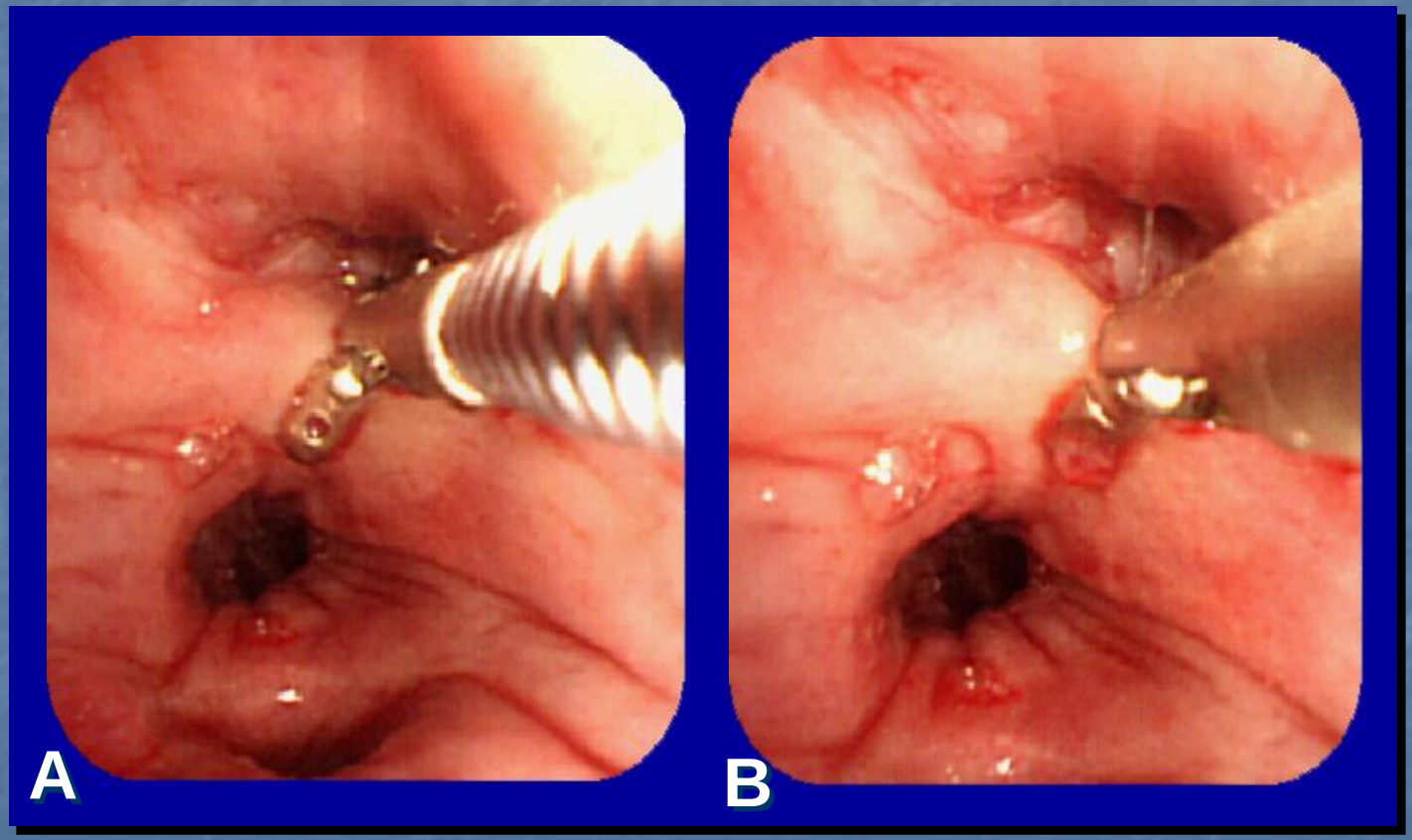
Close and biopsy

Obtaining the best specimen possible

- Use forceps with central tooth, especially if lesion is along lateral wall of trachea or bronchi.
- Obtain deep submucosal biopsies to increase yield for small cell carcinoma, Amyloidosis, Sarcoidosis and other infiltrating processes.
- Get close to the target area with the bronchoscope.

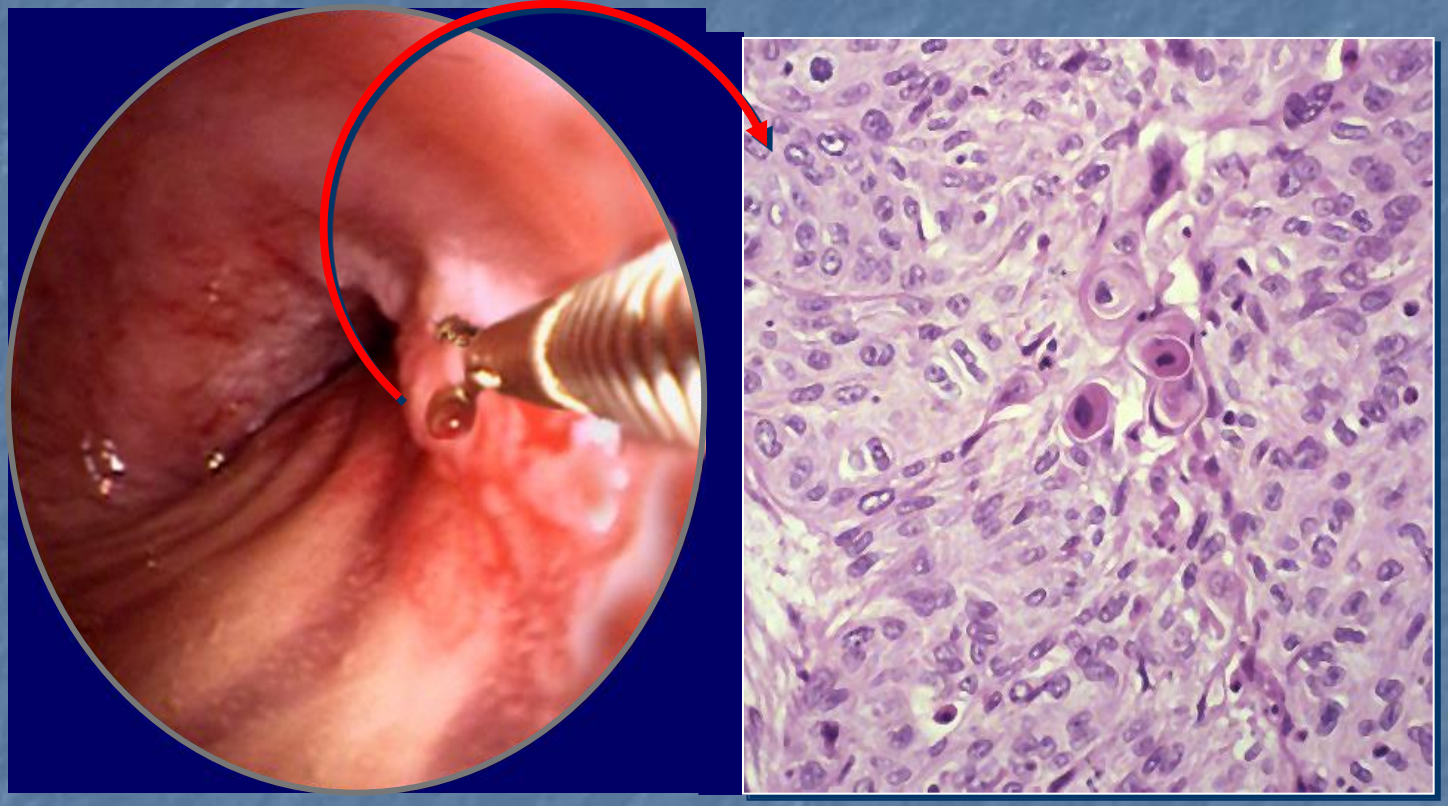
Click here for video

Deep, submucosal biopsy



Wedge the forceps onto the target area, push on the forceps to dig into the tissues, then close forceps

Use cup forceps or forceps with central tooth to anchor forceps onto lateral wall lesions



Grade 4 Squamous Cell Carcinoma in LMB

Yield of endobronchial biopsy

- Respir Med 1998;92:1110-5
  - 82% yield for malignancy if disease visible
  - Best yield probably with combination of brushings, washings, and biopsy material
  - Optimum sequence of procedures unknown
- Thorax 1982;37:684-7
  - 4-5 biopsy samples from visible lesion achieves at least a 90% positive rate for malignancy[2]
  - EBNA and TBNA probably superior to forceps biopsy in submucosal and peribronchial carcinoma

Diagnosis of Lung Cancer

Endobronchial Biopsy:

- 3-5 biopsies for 90 – 100 sensitivity in lung cancer
- Variable yield 67 – 100% d/t:
  - Sampling error,
  - crush artifacts, surface necrosis, inadequate tissue
  - submucosal disease
  - extrinsic compression

Endobronchial biopsy:
Biopsy or wash first ?

- Yield: Effect of different bronchial washing sequences on diagnostic yield in endoscopically visible lung cancer
  - 75 patients underwent washing pre/post endobronchial biopsy and brushing

TABLE 2
Diagnostic Yield of the Different Bronchoscopic Techniques by Type of Endobronchial Lesion*

	Endobronchial Mass (n=32)	Mucosal Infiltrate (n=29)	Submucosal Lesions (n=14)	Total (n=75)
BW-pre	16 (50%)	19 (65.5%)	5 (35.7%)	40 (53.3%)
BW-post	17 (53%)	19 (65.5%)	7 (50%)	43 (57.3%)
Combined BW-pre and BW-post	23 (71.9%)	22 (75.9%)	7 (50%)	52 (69.3%)
Brushing	25 (78.1%)	20 (69%)	7 (50%)	52 (69.3%)
Biopsy	30 (93.8%)	28 (96.6%)	10 (71.4%)	68 (90.7%)
All	32 (100%)	28 (96.6%)	11 (78.6%)	71 (94.7%)

*BW-pre indicates bronchial washing performed before biopsy and brushing; BW-post, bronchial washing performed after biopsy and brushing.

Arch Bronconeumol. 2006;42(6):278-82

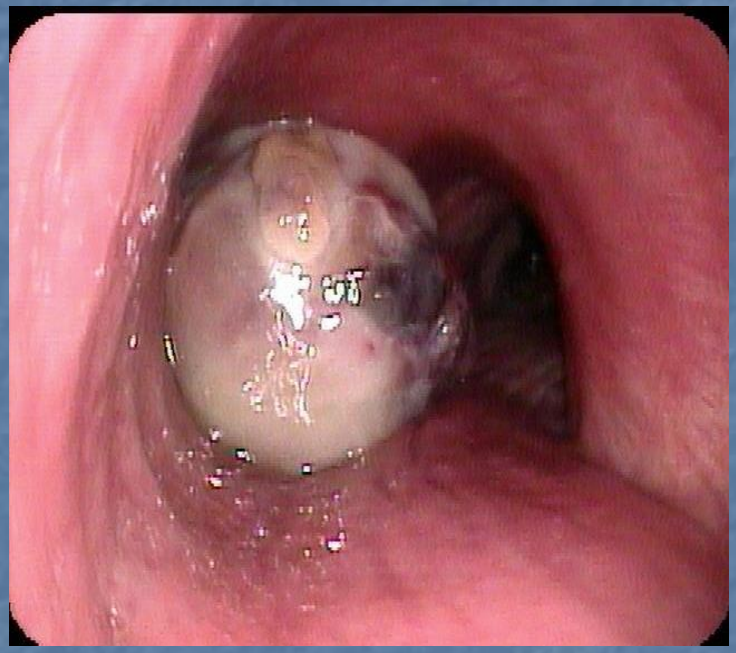
Endobronchial biopsy:
Sarcoidosis

- Yield: Endobronchial biopsy (EBB) for sarcoid
  - 34 patients underwent TBBX and EBB
  - If airways appeared normal – biopsies from main and a secondary carina
  - EBB positive in 62%
  - TBBX positive in 59%
  - Addition of EBB increased yield by 21%
  - EBB positive in 30% of patients with normal airway
  - No additional complications from EBB

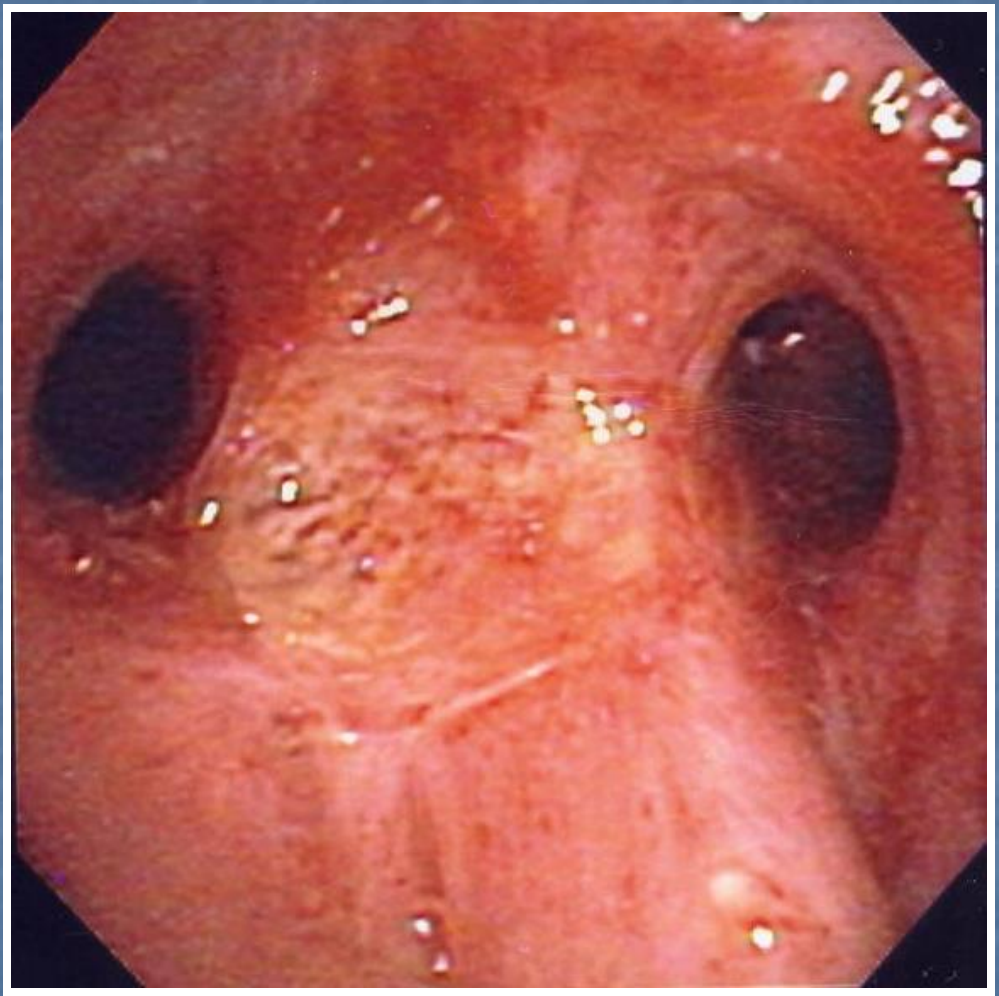
CHEST 2001;120:109-114

False negatives do occur

- Due to necrotic surface or if process 2-3 mm below mucosal surface
  - Absence of blood suggests necrosis
- Therefore, take biopsies until the core is reached

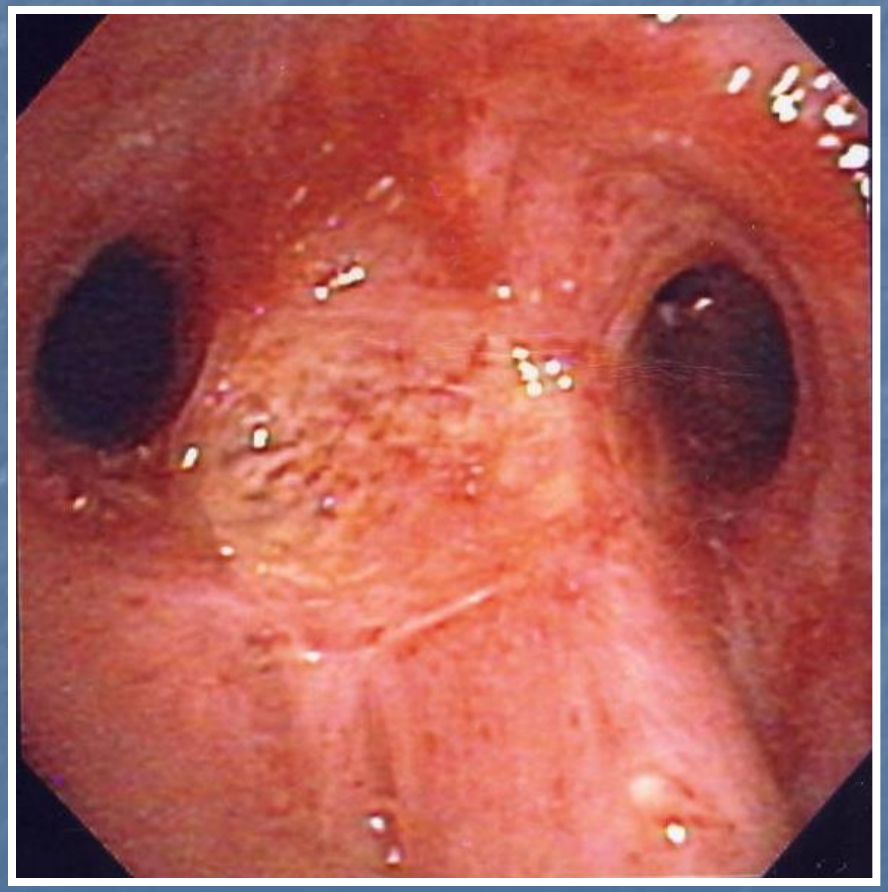


Case example: 72 year old with hemoptysis



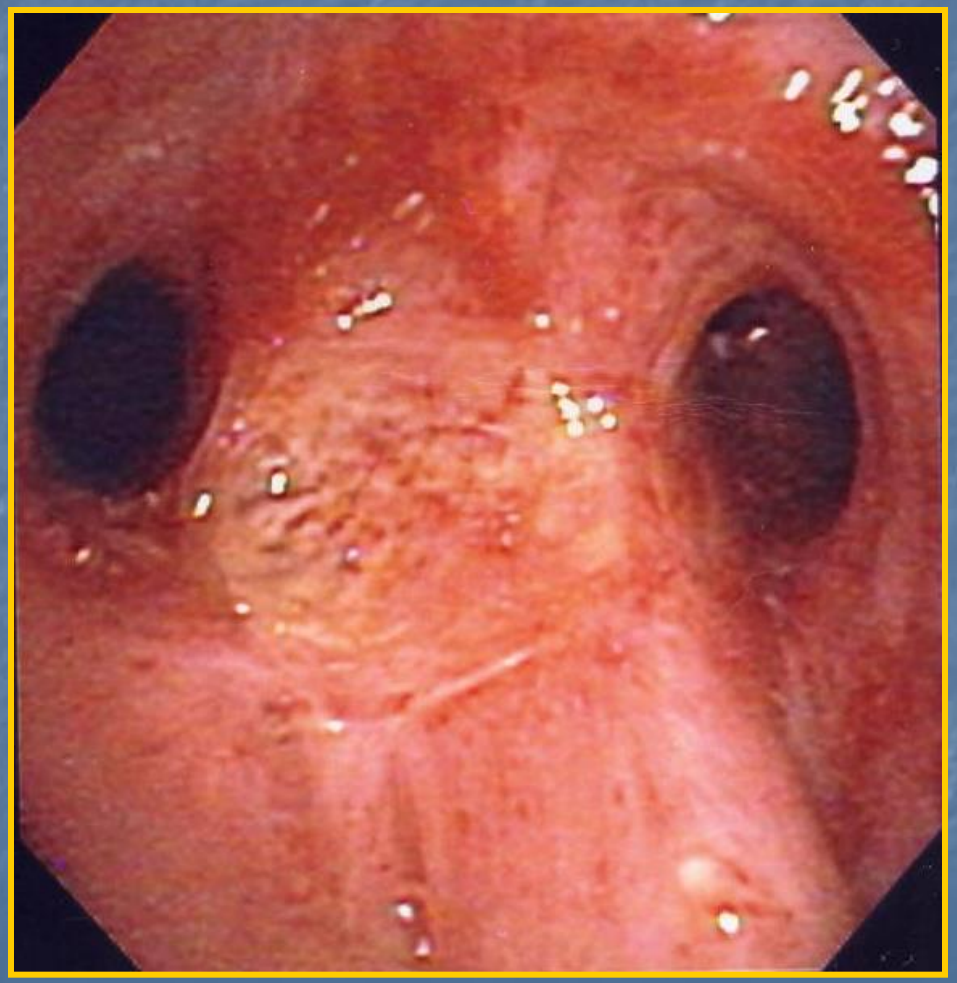
- 72 year old, non-smoker female with Diabetes, on 50 mg/d Prednisone presents with hemoptysis, fever and wheezing.
- ANCA negative
- ANA negative
- PPD negative

Your diagnosis is ?



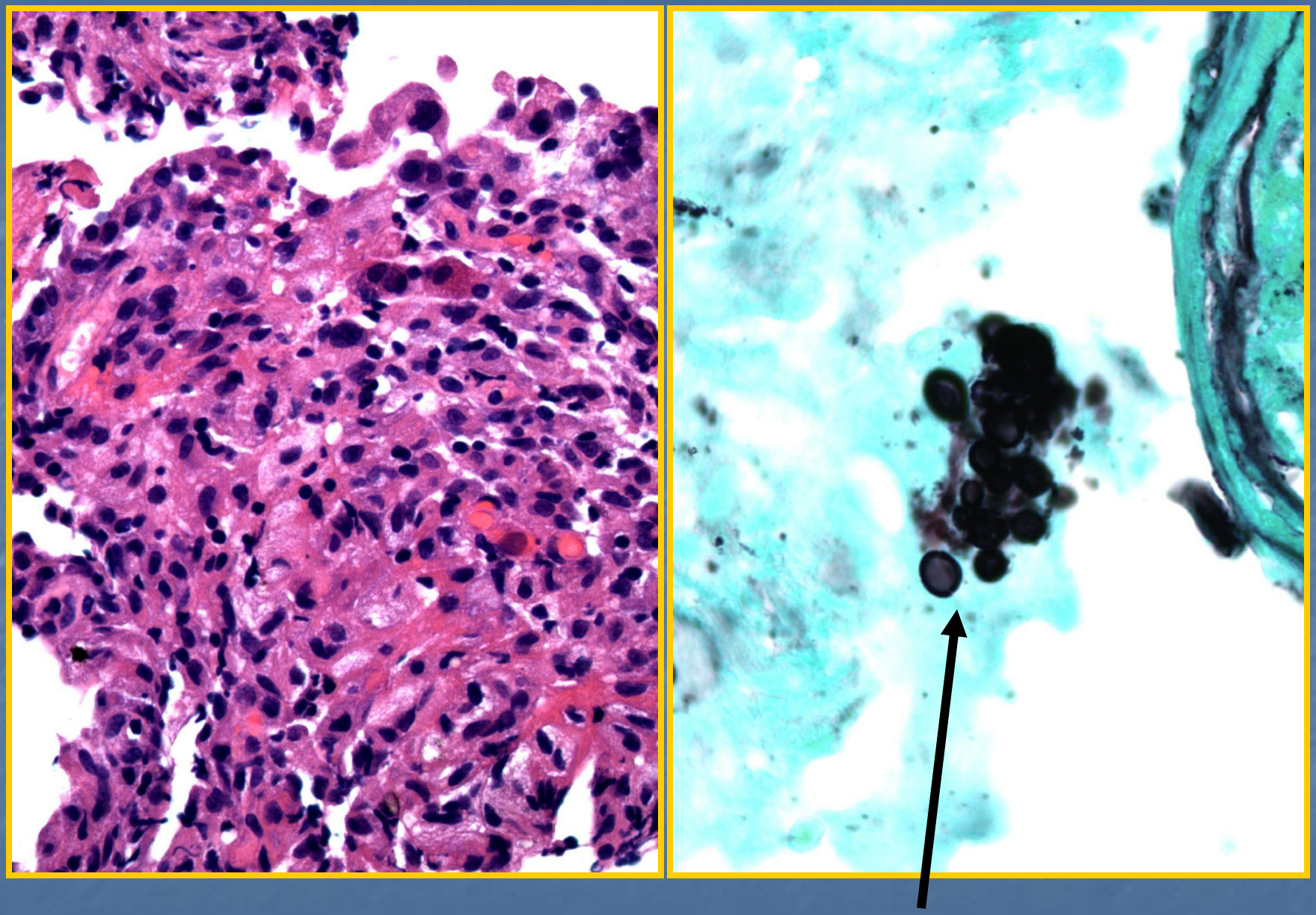
A. Endobronchial Wegener's
B. Endobronchial tuberculosis
C. Tracheobronchitis from inflammatory bowel disease
D. Squamous cell carcinoma
E. Endobronchial Cryptococcosis

The answer is Endobronchial Cryptococcosis



- Rare, Incidence unknown
- Presentation: Mass, plaque, sub-mucosal infiltration, Ulcer

From: JOB 2005; 12(4): 236-238


Fungal elements

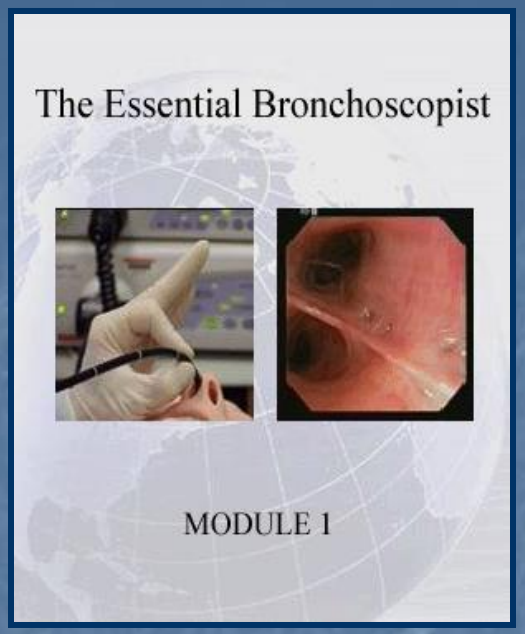
Complications of endobronchial biopsy

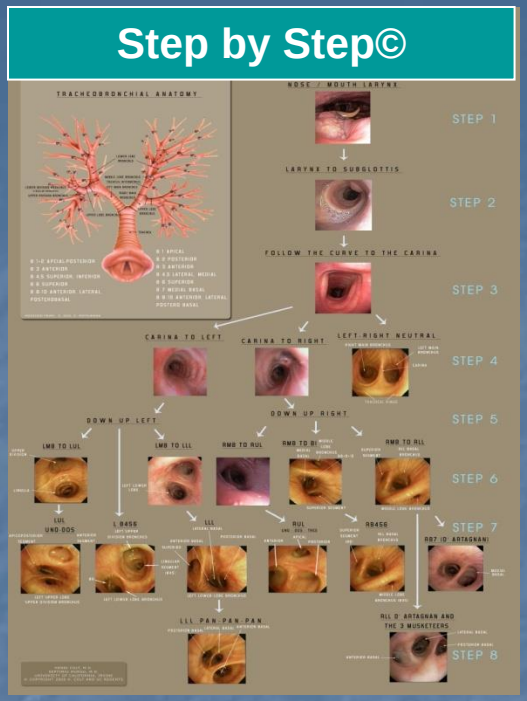
- Chest 1991;100:1141-7
  - Profuse bleeding less likely than in Transbronchial biopsies
  - Increased risk in Uremia, pulmonary hypertension, liver disease, thrombocytopenia and immunosuppression
  - Superior vena cava syndrome – no literature on risk of biopsy bleeding

Complications of endobronchial biopsy

- Thorax 2001;56(suppl I)i1-i21 British Thoracic Society guidelines
  - Routine PT/PTT/platelet counts not indicated unless known risk factors
  - It is unclear whether there is a safe level of INR or platelets

This presentation is part of a comprehensive curriculum for Flexible Bronchoscopy. Our goals are to help health care workers become better at what they do, and to decrease the burden of procedure-related training on patients.





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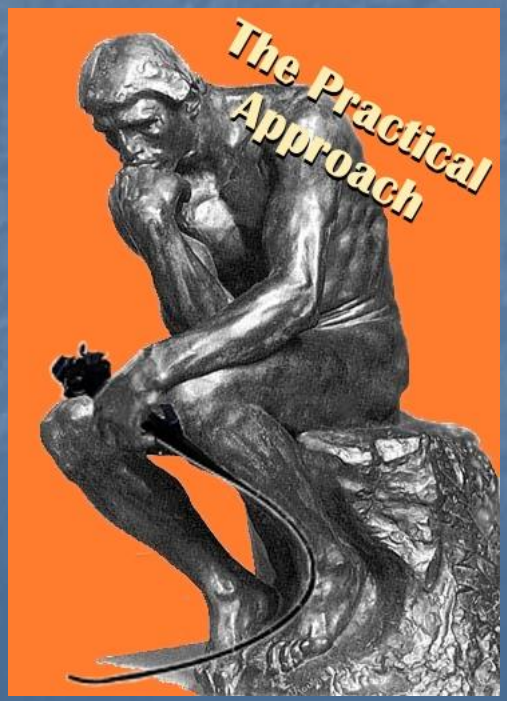

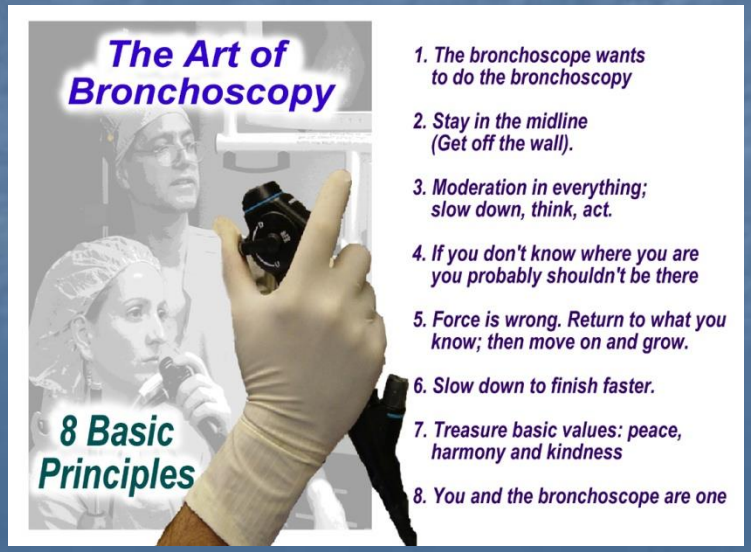

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Thank you

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