BRONCHOALVEOLAR LAVAGE (BAL)

In localized disease, the involved segment should be chosen for lavage. In diffuse lung disease, the middle lobe, anterior segment or lateral segment of the lower lobe should be chosen. Select lobe to be lavaged from morning CXR.

Indications

- To obtain lower respiratory tract specimens from immunocompromised patients with pneumonia for microbiological studies
- To obtain lower respiratory tract specimens from patients with pneumonia refractory to usual empirical treatment
- Diagnosis of nosocomial pneumonia in selected patients
    - Determination of colonization vs infection in chronically ventilated patients
    - These patients should be ideally off antibiotics for 24-48 hours
    - Sufficient reserve to tolerate procedure
        - Ideally paO_2 > 70 mmHg and FiO2 < 0.7
        - BAL will commonly result in a 10% reduction in PaO_2 for up to 24 hours after procedure

Procedure

- In this SARS era, please take note of infection control policies and personal protection. Check with the unit's infection control officer
- Place patient on 100% oxygen
- Ensure sufficient sedation, muscle relaxation and IPPV
- Local anaesthetic is contra-indicated (interferes with culture media)
- If possible, do not suction through the scope prior to lavage (upper airway bacterial contamination)
- Pass scope into selected lobe
- BAL should be performed after general inspection of all the brochopulmonary segments before biopsy or brushing
- Wedge scope as far as possible – ideally into subsegmental bronchus
- Use sterile saline – should be infused through the working channel of the scope in 20 ml aliquots. The total recommended volume instilled is 100-150 mls
- There is no standardized dwell time. However, excessive dwell time may allow BAL fluid to cross the alveolar-capillary membrane.
- Low level of suction pressure should be used to avoid collapsing the distal bronchi or traumatizing the mucosa
- Aspirate between aliquot and label aliquot accordingly. The first aliquot is usually poorly recovered, and usually contains a disproportionate amount of bronchial material. Some people may separate the recovery of the first aliquot from the rest of BAL for analysis. Recovery of fluid is decreased in smokers and patients with COPD.

- Send aspirates for culture as directed
- CXR post BAL

For immunocompromised patients with pneumonia, BAL should be sent to microbiology for the following tests:

1. Routine culture and sensitivity
2. Microscopy for acid fast bacilli and mycobacterial culture
3. Fungal culture
4. Pneumocystis carinii
5. Viral studies including
    a. Direct detection for respiratory syncytial virus (RSV), influenza B. Results will be available within the same working day
    b. Conventional virus isolation that covers all cultivable respiratory viruses including influenza A&B, parainfluenza 1,2&3, adenovirus, RSV, also enterovirus, HSV. The results will be available in about 10 days
    c. Rapid shell vial isolation for CMV. The result will be available in about 2 days

NB. In PWH, viral studies can be done automatically on BAL specimens without prior arrangement with duty virologist. Please perform BAL during working hours. Prior arrangement with duty microbiologist not necessary but is recommended.

Reference

British Thoracic Society Bronchoscopy Guidelines Committee: British Thoracic Society guidelines on diagnostic flexible bronchoscopy. Thorax 2001; 56(Suppl 1) i1- i21