

Bronchoalveolar Lavage. Technical Notes

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Bronchoalveolar lavage (BAL) should be performed with at least 100 ml. Small volume lavage (less than 20 ml) in a main stem bronchus or a segmental bronchus recovered more epithelial cells and neutrophils while a lavage volume of 20-100 ml in a segmental bronchus recovered more lymphocytes, alveolar macrophages, albumin, IgG and alpha 1-antitrypsin. Boluses of 10, 20, and 50 ml were associated with a recovery of 22%, 10%, and 5% of neutrophils, respectively [1] (*Evidence: Ia*).

BAL fluid should be analysed in specialised laboratories and microbiological investigations, cytological analysis and cytofluorimetric procedures are considered as the more appropriate workup [2] (*Level of evidence: Ia*).

Recommendation

- **BAL should be performed with at least 100 ml of saline solution (Grade A).**

Patient safety

Patients submitted to BAL may experience hypoxia (generally transient) during bronchoscopy. Fever may appear a few hours later in up to 30% of cases. Other complications are extremely rare also in immunocompromised hosts or in mechanically ventilated patients [2-5] (*Level of evidence: Ia*).

Recommendation

- **BAL is a safe procedure also in immunocompromised hosts and in mechanically ventilated patients (Grade A).**

Diagnostic role

The diagnostic role of BAL is fundamental in patients with pulmonary infiltrates and compromised immune systems. Diagnoses feasible on the basis of BAL findings in this clinical setting are reported in Table 1. Non-invasive and bronchoscopic procedures are useful techniques for the diagnosis of pulmonary

infiltrates in immunocompromised patients. Fibro-Bronchial ASpirate (FBAS), TracheoBronchial ASpirate (TBAS) and BAL have the highest diagnostic yield and impact on therapeutic decisions [4-8].

Table 1. - Diagnoses feasible on the basis of BAL findings in immunocompromised patients

P. jiroveci Pneumonia
Mycobacterioses
Legionellosis
Viral pneumonitis (intranuclear and intracytoplasmatic)
Inclusions, shell vial cultures
Diffuse alveolar damage
Eosinophilic pneumonia
Alveolar haemorrhage
Epithelial neoplastic cells
Lymphoid atypical cells
Myeloid cells

(*Level of evidence Ia*)

Recommendation

- **BAL is a first choice diagnostic procedure in immuno-compromised hosts (Grade A).**

In immuno-competent patients BAL is diagnostic in rare disorders such as alveolar proteinosis, Langerhans cell histiocytosis, eosinophilic pneumonia; in these cases this procedure may spare a biopsy. In more common diffuse interstitial or alveolar pneumonitis it is part of the diagnostic work up [9, 10] (*Level of evidence: IIa*).

Recommendation

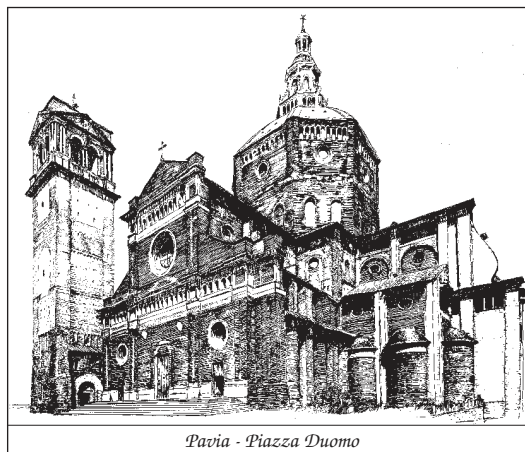
- **BAL should be part of the diagnostic workup in immuno-competent hosts with diffuse parenchymal lung disease (Grade B).**

Summary of Recommendations

- **BAL should be performed with at least 100 ml of saline solution (Grade A).**
- **BAL is a safe procedure also in immunocompromised hosts and in mechanically ventilated patients (Grade A).**
- **BAL is a first choice diagnostic procedure in immunocompromised hosts (Grade A).**
- **BAL should be part of the diagnostic workup in immuno-competent hosts with diffuse parenchymal lung disease (Grade B).**

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