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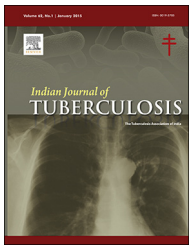

Original Article

Endobronchial ultrasound experience in a high tuberculosis prevalence setting

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ABSTRACT

Background: Most of the published endobronchial ultrasound-guided transbronchial needle aspiration (EBUS–TBNA) data are from the western countries, establishing the role of EBUS–TBNA in the diagnosis and staging of lung cancer. The etiology of mediastinal lymphadenopathy may be different in an ethnic group with a high prevalence of tuberculosis (TB).
Objective: To assess the etiology of mediastinal adenopathy in a high TB prevalence setting and to determine the performance of various tests in the diagnosis of tuberculous mediastinal lymphadenitis.
Methods: Retrospective analysis of bronchoscopic data of patients who underwent endobronchial ultrasound (EBUS) in a tertiary care center in India.
Results: Out of 138 patients who underwent EBUS, 63 (46%) had granulomatous disease. Of the 35 patients with a diagnosis of TB, in 10 (29%), microbiology of EBUS specimens was diagnostic and in 3 (9%), this was the sole diagnostic feature. In 5 (14%) mycobacterial cultures were positive, in 6 (17%) GeneXpert for Mycobacterium tuberculosis/rifampicin resistance (Xpert MTB/RIF) was positive, and in 3 (9%) acid fast smears were positive.
Conclusion: In high TB prevalence countries, EBUS diagnoses a higher number of granulomatous than malignant diseases. EBUS specimen should, therefore, be subjected also to mycobacterial smear, culture, and Xpert MTB/RIF for optimal results.

1. Introduction

Endobronchial ultrasound (EBUS) allows visualization of mediastinal structures and convex probe EBUS allows real time sampling of the mediastinal and hilar lymph nodes. Most of the published data on endobronchial ultrasound guided transbronchial needle aspiration (EBUS–TBNA) are from the western countries. These data have established the role of EBUS–TBNA in the diagnosis and staging of lung cancer. It is likely that the etiology of mediastinal lymphadenitis would be different in a different ethnic group, particularly in those with a

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Abbreviations: EBUS, endobronchial ultrasound; TBNA, transbronchial needle aspiration; Xpert MTB/RIF, GeneXpert for Mycobacterium tuberculosis/rifampicin resistance; TB, tuberculosis; CT, computer tomography; AFB, acid fast bacilli.

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Table 1 – Spectrum of diagnosis in patients who underwent EBUS.

Diagnosis		n = 138 (%)
Granulomatous disease n = 63 (46%)	Tuberculosis	27 (20)
	Sarcoidosis	27 (20)
	Tuberculosis and sarcoidosis	8 (6)
	Sarcoidosis and malignancy	1 (1)
Others n = 75 (54%)	Malignancy	43 (31)
	Non-diagnostic	29 (21)
	Non-representative	3 (2)

EBUS – endobronchial ultrasound.

high prevalence of tuberculosis (TB). In this group, until the recent advent of endoscopic ultrasound (EUS) Fine needle aspiration (FNA)/EBUS–TBNA, since mediastinoscopy service was either not easily accessible or too invasive for these patients, those with mediastinal adenopathy alone often received a therapeutic trial with antitubercular drugs. Also, differentiating sarcoidosis from TB is a challenge, since both these conditions would reveal granulomatous inflammation, and a clinico-radiological correlation would often be needed. Although presence of caseation is in favor of TB, not all TB lymphadenitis would reveal this finding. Furthermore, microbiological studies including Mycobacterial culture could turn out to be negative, fairly commonly.[1] EBUS adds to the armamentarium to clinch the diagnosis of mediastinal lymphadenitis. We report our experience of 138 consecutive patients who underwent EBUS–TBNA.

2. Methods

We performed a retrospective analysis of clinical, radiologic, and bronchoscopic data of patients who underwent EBUS in a tertiary care center in southern India from May 2011 to December 2013. Institutional ethics committee approved the study. Written informed consent had been obtained from the subjects for the procedure, as per institutional protocol. All patients had a computed tomography (CT) scan confirming mediastinal adenopathy.

It was departmental policy to carefully search for more accessible nodes before proceeding to EBUS. Therefore, it could be said that anyone who underwent EBUS–TBNA had no other more accessible node for biopsy. Likewise, all patients with chest X-ray opacities and sputum production were subjected initially to sputum microscopy to exclude TB, before EBUS was performed.

EBUS was done as a day care procedure with conscious sedation using midazolam and fentanyl as per standard protocol. EBUS scope (BF_UC180F; Olympus Medical Systems, Singapore) with the compatible endoscopic unit was used. Under real time guidance, the lesions were punctured with disposable 21-gauge Vizishot needle (NA-201SX-4021 Olympus Medical Systems, Singapore). The needle was moved back and forth with or without suction. Depending on the samples obtained, up to 4 passes were made in to each node. The sample was considered as representative if it showed a preponderance of lymphocytes or pathological cells. As clinically indicated, bronchoalveolar lavage (BAL), endobronchial biopsy and transbronchial lung biopsy (TBLB) were also done. EBUS and bronchoscopic specimens were apportioned for testing based on the quantity obtained, and the likelihood of the tests contributing to the diagnosis.

The EBUS sample was normally sent for cytology, polymerase chain reaction testing for TB (GeneXpert for Mycobacterium tuberculosis/rifampicin resistance – Xpert MTB/RIF) and mycobacterial cultures. Rapid onsite evaluation (ROSE) was not performed in most cases. The results of these tests contributed to the final diagnosis, along with the clinico-radiologic features.

3. Results

Out of 138 patients who underwent EBUS, it was diagnostic in 106 (77%) – 63 (46%) had granulomatous disease and 43 (31%) malignancy. EBUS was non-diagnostic in 29 (21%) lymph node samples. The sample was not representative of lymph node in 3 (2%).

Out of 63 patients with granulomatous disease, 27 (43%) were ultimately diagnosed as sarcoidosis, 27 (43%) as TB, 8 (13%) as both sarcoidosis and TB, and 1 (1.6%) as both malignancy and sarcoidosis (Table 1). The baseline characteristics of the patients with granulomatous disease are tabulated in Table 2. Subcarinal and right lower paratracheal lymph nodes were the most common groups of lymph nodes that were involved in this group.

Of the 35 patients with a diagnosis of TB, in 10 (29%), microbiology of EBUS specimens was diagnostic, and in 3 (9%), this was the sole diagnostic feature. In 5 (14%) mycobacterial cultures were positive, in 6 (17%) Xpert was positive, and in 3 (9%) AFB smears were positive. None of them samples tested

Table 2 – Baseline characteristics of patients with granulomatous disease on endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) (n = 63).

Characteristic	
Average age – stratified by diagnosis	
Tuberculosis (27)	37
Sarcoid (27)	48
Tuberculosis and sarcoid (8)	43
Malignancy with sarcoid (1)	42
All (63)	42
Sex	
Male	23 (37%)
Female	40 (63%)
Lymph node station and size on CT[a] (n = 62)	(short axis on CT in mm, range)
Subcarinal 7 (n = 44)	22.3 (6–45)
Right lower paratracheal 4R (n = 51)	23.3 (7–45)
Left lower paratracheal 4L (n = 3)	22
Right upper paratracheal 2R (n = 1)	30
Right hilar 10R (n = 5)	12.6 (8–16)
Left hilar 10L (n = 2)	22.5
Left interlobar 11L (n = 1)	26

[a] 1 patient had a CT film without a scale and hence lymph node dimensions could not be measured.

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