

## Original Article

### Role of Conventional TBNA in Mediastinal Adenopathy

<sup>1</sup>Mahavir Modi, <sup>2</sup>K Sai Kiran, <sup>3</sup>Shwetang Jani, <sup>3</sup>Dipak Dhangar, <sup>3</sup>Nikhil Chillal

<sup>1</sup>Consultant Pulmonologist, <sup>2</sup>Third year resident, <sup>3</sup>Second year resident, Department of Respiratory Medicine, Ruby Hall Clinic, Pune, Maharashtra.

#### Abstract

**Background:** Mediastinal adenopathy remains one of the most common challenging cases to a pulmonologist. TBNA is a safe and minimally invasive flexible bronchoscopic technique. In set-ups, where EBUS is not available, TBNA still remains the ultimate modality in the diagnosis of mediastinal adenopathy.

**Objective:** The aim of this study is to assess the diagnostic yield of conventional TBNA in mediastinal adenopathy.

**Material and Methods:** It is a retrospective study performed in Ruby Hall Clinic, Pune from November 2014 to March 2016. Fifty cases of mediastinal adenopathy were assessed as per history, clinical examination, CT findings, location of nodes and risk assessments. TBNA was performed in all the patients. ROSE technique was not utilized. The slides were fixed and sent for cytological examination.

**Results:** Of the 50 cases, sample was adequate in 45 patients (90% yield). In 40 out of 50 cases a definite diagnosis could be made (80% diagnostic rate) and the rest 10 cases were undiagnosed (20%). Most common lymph node station accessed was subcarinal in 40 patients (80 %) followed by paratracheal in 7 patients (14 %) and hilar in 3(6%). Out of the 40 patients in whom TBNA was diagnostic, 20 patients (50%) were sarcoidosis, 17 patients (42.5%) were TB and remaining 3 patients (7.5%) were metastasis from adenocarcinoma.

**Conclusions:** Sarcoidosis is becoming as common as TB in our developing world and we are westernizing in a true sense. Conventional TBNA still remains a safe modality for the diagnosis of mediastinal adenopathy especially where EBUS is not available.

**Keywords:** Cytology, Endobronchial Ultrasound (EBUS), Mediastinal Adenopathy, Rapid onsite evaluation (ROSE), Transbronchial needle aspiration (TBNA)

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#### Introduction

Mediastinal adenopathy remains one of the most common challenging cases to a pulmonologist. Mediastinal node sampling techniques include mediastinoscopy, conventional TBNA and EBUS-TBNA. In era of increasing incidence of tuberculosis, it remains inevitable for us to come to a conclusion between TB, Sarcoidosis, Lymphoma and reactionary nodes. TBNA is a safe and minimally invasive bronchoscopic technique. Though it is highly specific, the

sensitivity and accuracy of TBNA varies depending on the study method used, patient population, severity of disease and location of mediastinal nodes. Conventional "blind" TBNA should be a "sine quo non" of routine bronchoscopy.<sup>1</sup> Though many authors propose the use of conventional TBNA on a routine basis in diagnostic flexible bronchoscopic sampling, it is often an underutilized and or underemphasized diagnostic modality.<sup>2</sup> In a study conducted in the United States, only 11% of practicing pulmonologists reported

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performing TBNA on a routine basis.<sup>3</sup> The yield for TBNA varies widely in the literature from 20% to 89%, and depends on the size and location of the lesions, as well as to the bronchoscopist's experience.<sup>4-5</sup> The aim of this study is to prove the positive role of conventional TBNA in mediastinal adenopathy.

### Material and Methods

It is a retrospective study which was performed in Ruby Hall Clinic, Pune during the period of November 2014 to March 2016. Our study population included 50 patients of mediastinal adenopathy who were assessed as per history, clinical examination, contrast enhanced computerized tomography (CECT) findings, location of nodes and risk assessments.

Patients with only mediastinal adenopathy with grossly normal lung parenchyma on CT scan images were included in the study. Patients who were treated for malignancy completely and now had mediastinal nodes with a normal lung parenchyma were included in the study. Patients with active TB, diagnosed with sputum microscopy or HRCT, sarcoidosis with lung involvement and proven malignancy on treatment were excluded.

All patients were adults of more than 22 years of age. The location of nodes and type of needle to be used was pre-decided. Conventional TBNA using a flexible fiberoptic bronchoscope was done in all the 50 cases. Olympus video bronchoscope with inner diameter of 5.5mm and working channel 2mm was used. Olympus 21Gz TBNA needle was used for cytology and 18Gz needle was used for histology. Fluoroscopy and EBUS was not used due to non-availability.

The techniques used by the stalwarts in the field of TBNA were reassessed and modified accordingly. The technique used

was the jabbing technique, piggyback technique, hub against wall technique as per the need.

The slides were rapidly fixed with ether-alcohol spray and ROSE technique was not utilized due to unavailability of the necessary equipment and materials. The samples were considered adequate when adequate lymphocytes were seen on cytology and samples which showed only bronchial epithelial cells, RBCs and blood clots were considered as inadequate.

### Results

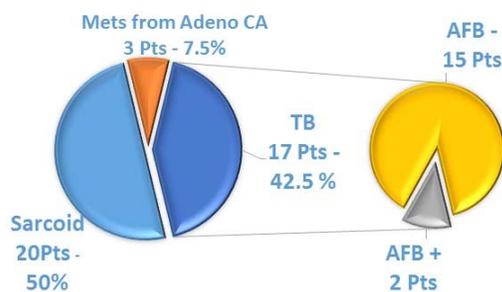
Lymph node sample was adequate in 45 out of the 50 patients (90 % yield) and inadequate in 5 patients (10%). The cytological examination done from the TBNA smears were diagnostic in 40 out of the 50 patients (overall diagnostic accuracy 80%) and nondiagnostic in 10 (20%).

Out of 45 samples with adequate material on the slides, TBNA was diagnostic in 40 out of 45 patients (88.88%) and non-diagnostic in 5 patients (11.11%). The most common lymph node stations sampled during TBNA were subcarinal node in 40 out of 50 patients (80%), followed by paratracheal nodes in 7 patients (14%) and hilar nodes in 3 patients (6%). In all of these patients, the largest and the most easily accessible single lymph node station was sampled on 3 attempts.

Out of 40 patients in whom TBNA was diagnostic, 20 patients (50%) were non-caseating granulomas resembling sarcoidosis, 17 patients (42.5%) were Tuberculosis (AFB staining was positive in 2 patients and negative in 15 patients) and 3 patients (7.5%) were metastasis from adenocarcinoma (Figure 1). Results matched with the clinical context in all of these patients. Diagnosis of sarcoidosis was made on the basis of non-caseating granulomas along with clinical

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picture, CT findings of bilateral mediastinal adenopathy and negative Mantoux test. TB was diagnosed on TBNA report when caseating granulomas were seen, AFB staining was positive or GenXpert for MTB was positive. Metastasis from Adenocarcinoma was IHC proven. Cases which were reported as only lymphocytes, bronchial epithelial cells, RBCs and blood clots were considered as non-diagnostic. Patients with sarcoidosis and TB were closely followed up for minimum of 6 months.



**Figure 1. Results obtained from TBNA**

### Discussion

TBNA is a method that is used to obtain diagnostic samples from peribronchial or submucosal lesions by using a needle attached to a catheter which is usually introduced through a flexible bronchoscope.<sup>1</sup> It is less invasive, safe, reliable and cost effective bronchoscopic technique for diagnosis of intrathoracic adenopathies.<sup>6</sup> It can be done either through conventional method (Blind) or with the endo bronchial guidance (EBUS). Subcarinal, paratracheal, pretracheal and hilar nodes which are in contact with the tracheobronchial tree are accessible through conventional TBNA. In most of the centers around the developed world, EBUS-TBNA has emerged as the first line standard of care investigation modality for mediastinal lymph node sampling.<sup>7</sup>

In the context of developing countries like India where EBUS is available in only

few setups and the cost of the procedure being high is actually not affordable by many patients. The sensitivity of EBUS-TBNA is 88% to 93%.<sup>8-13</sup> On the basis of a systematic review published in 2003, conventional TBNA had a 76% sensitivity.<sup>8</sup> Felix Herth et al, reported the yield of conventional TBNA was 74% compared to 86% in the EBUS-guided group in subcarinal node when the size of lymph node was larger ( $1.76 \pm 0.47$  cm) and yield of conventional TBNA was 58% compared to 84% in the EBUS-guided group when the lymph node size was smaller ( $1.53 \pm 0.43$  cm).<sup>14</sup> A recent study published in 2014 again showed that the diagnostic yield of conventional TBNA and EBUS-TBNA performed in cases of malignancy were not significantly different.<sup>15</sup> Addition of Rapid on-site specimen cytologic evaluation (ROSE) to the basic conventional TBNA will increase the overall diagnostic value of specimen retrieved. In a study done by Robert Chin et al., whereby diagnosis of cancer was obtained in 71% of the cases when ROSE was applied, whereas only 25% were positive without ROSE. When TBNA was diagnostic for malignancy, the mean number of aspirates until the first positive TBNA was  $2.5 \pm 2.0$  with ROSE versus  $3.7 \pm 1.6$  without ROSE.<sup>[15]</sup> In our study, we have observed that the diagnostic accuracy of conventional TBNA was 80%. When compared with EBUS-TBNA the difference approximately is 8 to 10%, which is considerable. So, in Indian settings, where cost of the procedure matters a lot, conventional TBNA when applied correctly with the maximum utilization of available resources still remains a fairly accurate and safe modality of diagnosis of mediastinal adenopathy. For centers that are comfortable with conventional TBNA, performing conventional first and only escalating to EBUS when conventional is non-diagnostic is supported.<sup>16</sup>

### Conclusion

Sarcoidosis is becoming as common as TB in our developing world and we are westernizing in a true sense. Conventional TBNA when applied correctly with maximum utilization of available resources remain a fairly accurate and safe modality of diagnosis. It is more accurate when the size of lymph node is more than 2cm and the results become nearly equal to EBUS TBNA. ROSE is a very useful technique and definitely increases the diagnostic value of the specimen retrieved in malignancy. The methods we adopt decide the yield of successful conventional TBNA and hence, it is important for us to perform the procedure with maximum accuracy and expertise.

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