ORIGINAL RESEARCH PAPER

Pulmonary Medicine

# DOES A SHORT TRAINING IN EBUS GUIDED TBNA IMPROVE YIELD OF CONVENTIONAL TBNA?

**KEY WORDS:** Fibreoptic Bronchoscopy; Ebus; Tbna; Mediastinal Lymphadenopathy

**Lt Col (Dr) Manu Chopra** Pulmonologist, Army Hospital (Research & Referral), Delhi -110010

**Lt Col (Dr) GPS Gahlot*** Pathologist, Army Hospital (Research & Referral), Delhi -110010 *Corresponding Author

**Brig (Dr) Vasu Vardhan** Consultant Pulmonologist, Army Hospital (Research & Referral), Delhi -110010

ABSTRACT

**Introduction:** Conventional Trans bronchial needle aspiration (c-TBNA) is a blind procedure guided by CT picture & experience, thus yield is usually poor. Endobronchial Ultrasound (EBUS) guided TBNA helps to visualize mediastinal lymph nodes [LN] in real time, thereby improving yield. A better understanding of mediastinal anatomy as seen with EBUS should help in improving c-TBNA yield. We, thus, analyzed our c-TBNA results pre-& post short EBUS-TBNA training.

**Aim:** Does a short training in EBUS guided TBNA improve yield of c-TBNA

**Methods:** An experimental study was carried out to compare outcomes of 300 c-TBNA's performed pre-& post EBUS-TBNA training using chi square test.

**Results:** Out of 300 c-TBNA's carried out pre EBUS training, 50 yielded results, whereas, 130 out of 300 yielded results post training. An improvement of over two and a half times was seen.

**Conclusion:** Bronchoscopists are expert in various endobronchial procedures. The unguided nature of c-TBNA, wherein, knowledge acquired from charts, diagrams & CT films leads to poor localization of mediastinal LN's yielding poor results. EBUS-TBNA though helps in real time visualization and sampling of mediastinal LN's, is not easily available due to cost. Various workshops are being carried out to teach EBUS -TBNA. Bronchoscopists who are master in c-TBNA procedure will surely improve their yield of c-TBNA post undergoing training in EBUS-TBNA, as the same would improve their mental picture of localization of various mediastinal Ln's.

## Introduction

Since the time Gustav Killian performed bronchoscopy to remove pork bone from right main bronchus of a child in 1897 and Shigeto Ikada inventing the first fiberoptic bronchoscope in 1966, fiberoptic bronchoscopy (FOB) has grown by leaps and bounds. It's no more an investigational tool to evaluate chronic cough, hemoptysis, wheeze, stridor, pneumonia or abnormal radiographic findings; to localize bronchopleural fistulas or to diagnose and stage lung cancers; but FOB is also being used as a therapeutic modality in foreign body retrieval, endobronchial stentings or destruction of endobronchial tumor or obstruction by using Laser, electro or cryocautery.

The various diagnostic procedures carried out by FOB are bronchoalveolar lavage (BAL), TBNA, Transbronchial lung biopsy (TBLB), brush cytology and endobronchial biopsy. Of these TBLB and TBNA are blind procedures. The yield of c-TBNA is especially poor because of its inherent unguided nature. To improve yield of c-TBNA, techniques such as Rapid on-site evaluation (ROSE) or EBUS guided TBNA are being introduced. EBUS being a costly equipment, thus not easily available, but various courses & workshops are being carried out in India & abroad to provide training regarding EBUS- TBNA. We three bronchoscopists at a tertiary care chest centre of Indian Armed forces underwent a 5-day course of EBUS-TBNA. We analyzed our yield of c-TBNA pre- and post EBUS – TBNA training.

## Material & methods

An experimental study was carried out to compare outcomes of 300 c-TBNA's performed pre-& post EBUS – TBNA training.

Confounding factors i.e. the bronchoscopists, the bronchoscope, the technicians assisting the procedure, and the pathologist reporting the slides remained same.

Only the results obtained by c-TBNA were included. Diagnoses if made by other bronchoscopy diagnostic modalities like BAL, brush cytology or TBLB were not included. Thus, only yield of c-TBNA was compared.

**Results: -** Of the 300 cases who underwent c-TBNA pre EBUS training 210 were males and 90 were females (Table 1).

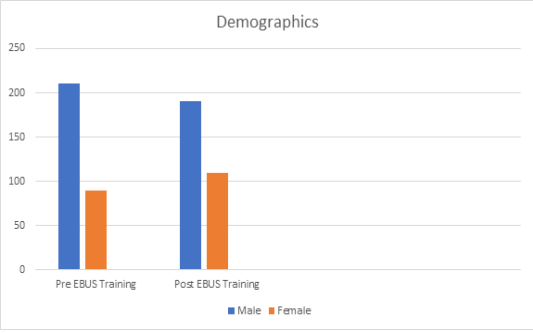


**Table 1 Demography**

The age group ranged from 17 to 82 years. The c-TBNA could help in establishing diagnosis in 50 cases i.e. 16.7% (Table 2)

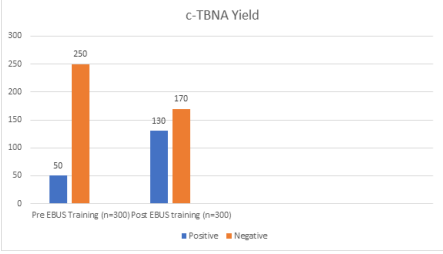


**Table 2 c-TBNA yield**

The 300 cases analyzed post EBUS training consisted of 190 males & 110 females (Table 1) with age group ranging from 20 to 85years. The c-TBNA could establish diagnosis in 130 cases i.e. 43.3% (Table 2).

The various diseases diagnosed by c-TBNA were as per Table 3. Chi square test was used for statistical analysis. A p-value of 0.024 was attained which indicated statistical significance.

| Results | c-TBNA Pre EBUS Training (n=50) | c-TBNA Post EBUS Training (n=130) |
|---|---|---|
| Tuberculosis | 18 | 48 |
| Sarcoidosis | 10 | 31 |
| Bronchogenic carcinoma | 15 | 39 |
| Lymphoma | 5 | 8 |
| No specific pathology | 2 | 4 |

**Table 3- Results**

## Discussion

c- TBNA was introduced as a diagnostic modality in 1949 & it's first application via flexible bronchoscopy was described in 1981. It helps to diagnose pulmonary and mediastinal lesions (particularly lung cancer) in a minimally invasive fashion.[1] But it remains an underutilized procedure, mainly because of low yield. The yield of c-TBNA ranges from 17-100% in myriad studies, but is usually 40-50%[2]

The main indications of TBNA are sampling of mediastinal and / or hilar lymphadenopathy to establish a histological diagnosis or to stage known or suspected bronchogenic carcinoma. It can also be used to sample endobronchial lesions or parabronchial growths compressing the airways. With guidance peripheral nodules or masses can be sampled. It can also be used for diagnosis and / or drainage of mediastinal cysts and/ or absesses[3]

c-TBNA is a blind procedure and the LN stations usually sampled are lower paratracheal, subcarinal and hilar LN's. The remaining LN's or avoided in unguided c-TBNA due to risk of injuring vessels & structures in vicinity of these LN's.[4] This blind nature of c-TBNA due to relying on charts & CT images, led to introduction of EBUS guided TBNA in 2003.[5] The yield of EBUS – TBNA ranges form 89-96% in myriad studies. There are two types of probes in EBUS: - linear / convex probe & radial probe. EBUS helps in real time visualization of mediastinal structures, thus helping in proper localization of LN's, guiding aspiration & preventing invariant damage to vessels.[6]

The EBUS – TBNA has gained popularity in past 15 years but being a costly equipment, is not easily available. However, various workshops regarding training of EBUS are being carried out under aegis of various societies and organizations. Though attending workshops may only, give a glimpse regarding the procedure of EBUS – TBNA, but attending the same, we feel, lets the bronchoscopist learn about the mediastinal anatomy in a better way. A bronchoscopist is apt in performing routine c-TBNA procedures. Learning EBUS helps him/her to mentally localize the routinely aspirated mediastinal LN's in a better way, thereby improving yield of c-TBNA.

The results of our study prove the same i.e., attending workshops on EBUS helps to improve the yield of routine c-TBNA procedures being carried out in bronchoscopy suits.

The limitations of our study are, firstly, it is an experimental study. Secondly, less number of cases are studied. Thirdly, details regarding the LN stations sampled are not available. But the same should not influence the impact of study as the aim was to ascertain benefit of EBUS-TBNA training.

## Conclusion

Bronchoscopists are expert in various endobronchial procedures. The unguided nature of c-TBNA, wherein, knowledge acquired from charts, diagrams & CT films leads to poor localization of mediastinal LN's, thereby yielding poor results. EBUS-TBNA though helps in real time visualization and sampling of mediastinal LN's, is not easily available due to cost. Various workshops are being carried out to teach EBUS -TBNA. Bronchoscopists who are master in c-TBNA procedure will surely improve their yield of c-TBNA post undergoing training in EBUS-TBNA, as the same would improve their mental picture of localization of various mediastinal LN's. We thus recommend bronchoscopists to routinely attend workshops in EBUS-TBNA to improvise their skills.

## References


1. Dasgupta A, Mehta AC: Transbronchial needle aspiration: An underused diagnostic technique. Clin Chest Med. 20:39-51 1999
2. Sodhi A, Supakul R, Williams GW. Role of TBNA in diagnosing mediastinal lymphadenopathy. South Med J. 2017. Jan 110(10);33-36
3. Kupeli E, Corut R, Memis L, Eyuboglu FO. Transbronchial needle aspiration: a tool for a community bronchoscopist. J Bronchology Interv Pulmonol. 2012; 19 (2):115–20. Epub 2012/12/05. doi: 10.1097/LBR.0b013e31824dd19a PMID: 23207353
4. Bonifazi M, Zuccatosta L, Trisolini R, Moja L, Gasparini S. Transbronchial needle aspiration: a systematic review on predictors of a successful aspirate. Respiration. 2013; 86(2):123–34. Epub 2013/07/03. doi: 10.1159/000350466 PMID: 23817073
5. Krasnik M, Vilmann P, Larsen SS, Jacobsen GK. Preliminary experience with a new method of endoscopic transbronchial real time ultrasound guided biopsy for diagnosis of mediastinal and hilar lesions. Thorax. 2003; 58(12):1083–6. Epub 2003/12/04. PMID: 14645981; PubMed Central PMCID: PMCPMC1746528.
6. Sheski FD, Mathur PN. Endobronchial Ultrasound. Chest. 2008; 133:264-70