ORIGINAL ARTICLE

Spectrum of Endobronchial Ultrasound-guided Transbronchial Needle Aspiration (EBUS-TBNA) in the Diagnosis of Mediastinal Lymphadenopathy: An Experience at Tertiary Care Center

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ABSTRACT

Introduction: Endobronchial Ultrasound-guided Transbronchial Needle Aspiration (EBUS TBNA) is a new minimally invasive technique presently used for evaluating mediastinal lesions. It has also proved to be valuable for the lymphnode (LN) staging of lung cancer, as well as for the primary diagnosis of unclear mediastinal lesions

Material and Methods: EBUS-FNAs from mediastinal lymph nodes were retrospectively reviewed from January 2020 to January 2022 and their findings were correlated with the histology.

Results: A total of 60 cases were obtained. Out of which, 3 cases were non diagnostic, and 57 cases were diagnostic. Three cases were reactive hyperplasia, seventeen were granulomatous lymphadenitis and thirty-seven cases were positive for malignant cells. Out of the thirty-seven positive cases for malignant cells, a biopsy was received in 29 of them and 27 cases showed positive histological correlation.

Conclusion: EBUS-FNA is a rapid, safe, and effective method that can be used routinely to diagnose mediastinal lesions.

Keywords: EBUS, Lymph nodes, Granulomatous.

INTRODUCTION

Endobronchial ultrasound–guided trans-bronchial–needle aspiration (EBUS–TBNA) is a new minimally invasive modality presently used for evaluating mediastinal lesions.[1] It has also proved to be valuable for the lymph node (LN) staging of lung cancer and the primary diagnosis of unclear mediastinal lesions.[2,3] Furthermore, EBUS-TBNA can provide visualization of the parabronchial structure to precisely locate peripheral lung lesions and increase diagnostic rate.[4] Real-time ultrasound-guided bronchoscopy, termed endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA), was first applied in clinical practice in 2002.[5] At present, it is a widely used, safe, and reliable technique for obtaining a pathological sampling from hilar and mediastinal LNs.[6] Mediastinal lymphadenopathy and peribronchial/paratracheal lesions are challenging situations for clinicians owing to diversity of etiologies and the difficulty in obtaining tissue sampling from these regions.[7] Lung hilar and mediastinal LN enlargement is frequently involved in lung cancer, mediastinal tumors, tuberculosis, and sarcoidosis.[8] EBUS- TBNA can be performed as an outpatient procedure under local anaesthesia and conscious sedation to access mediastinal and hilar lymph nodes.[9] It is a promising tool for diagnosis of mediastinal lymphadenopathy in a developing country like India with high prevalence of tuberculosis and lung malignancy.[10,11]

The study aimed to assess the diagnostic yield, sensitivity, and specificity of EBUS-TBNA in patients with Computed Tomography (CT) scan proven mediastinal lymphadenopathy and to correlate the EBUS FNA results with gold standard, i.e., biopsy.

MATERIAL AND METHODS

Consecutive patients with hilar and mediastinal LN enlargement who underwent EBUS-TBNA between January 2020 and January 2022 were retrospectively reviewed.

Inclusion criteria were: age 18–90 years; chest computed tomography proven hilar or mediastinal LN enlargement; no contraindications for bronchoscopy; and signed informed consent provided by the patient.

Exclusion criteria were: severe coagulopathy, severe cardiopulmonary dysfunction, acute asthma attack or massive hemoptysis, poor general state and intolerance

for anesthesia or known allergy to narcotic drugs. Statistical analysis: Data was compiled on the Excel sheet and appropriate statistical software was used. Compiled data was interpreted in the form of numbers, percentages, and statistical test of significance.SPSS software was used.

RESULTS

This study included a total of 60 EBUS-FNA specimens, including 39 men (65%) and 21 women (35%). The mean patient age was 58.6 years (age range, 25–83 years). All specimens were obtained during bronchoscopy under conscious sedation. Out of which, 2 cases were non-diagnostic and 58 cases were diagnostic. Cytological diagnoses were reactive hyperplasia in three cases, granulomatous lymphadenitis in fifteen cases and positive for malignancy in thirty-seven cases which were further subclassified as adenocarcinoma in 12 patients, squamous cell carcinoma in 05, small-cell lung carcinoma in 08, 09 metastases from extra-thoracic malignancy, 02 poorly differentiated non small cell lung carcinoma(NSCLC), 01 lymphoproliferative disorders. Of the thirty-seven positive cases for malignant cells, a biopsy was received in 29 of them and 27 cases showed positive histological correlation. One case was reported as suspicious for small cell carcinoma in EBUS-FNA, which was diagnosed as adenocarcinoma on histopathology from lung primary. The discrepancy in findings was due to degenerative cellular changes and hemorrhagic smears. Overall sensitivity, negative predictive value, and diagnostic accuracy were 91.7%, 78.5%, and 93.6%, respectively.

DISCUSSION

Mediastinal lymphadenopathy and peri-bronchial/paratracheal lesions are challenging situations for clinicians due to diversity of etiologies and, therefore, the difficulty obtaining tissue sampling from these regions. Other invasive modalities like CT-guided transthoracic needle aspiration, transbronchial lung biopsy (TBLB), conventional transbronchial needle aspiration (cTBNA), mediastinoscopy, and thoracotomy have been used in the past.[12] Though EBUS-TBNA is a new modality first introduced in practice in 2002, the increasing number of literatures have shown that EBUS-TBNA has become standard diagnostic method for the number of patients presenting with isolated mediastinal/hilar lymphadenopathy or peri-bronchial/paratracheal lesions of unknown primary.[13,14] EBUS-TBNA is safer than cTBNA because EBUS guidance provides real-time visualization of TBNA needle and thus helps avoid inadvertent vascular puncture or injury to other adjacent structures or lung.[15]

The third edition of the American College of Chest Physicians (ACCP) Guidelines for lung cancer recommended needle-based methods as first-line approaches for invasive mediastinal staging of non-small cell lung cancer (NSCLC),[16,17] which has attracted physicians as an alternative modality to surgical biopsy.[18] The various studies reported in the literature report typical diagnostic yields for EBUS-TBNA ranging between 80 and 100%.[19-22]

The present study showed similar results with an accuracy of 89.9% keeping with international reports. Variation in yield between different studies can be explained by differences in hospital volume of cases, operator skills, size and number of lymph nodes sampled.

The relatively high diagnostic accuracy of EBUS-TBNA in our study could be due to rapid on-site evaluation (ROSE), which allows for confirmation of true positive results, reducing the need for unnecessary additional passes, and confirmation of sample adequacy through the presence of lymphocytes.[23]

Our study has some limitations:
- Small sample size compared to other similar studies, but comparable in diagnostic yield and accuracy.
- This study being done in a tertiary care teaching hospital would not reflect the disease prevalence in the general population.

CONCLUSION

EBUS-TBNA with its good diagnostic yield, sensitivity, and specificity, in both benign and malignant disorders with lesser risks or complication rate is a promising tool in a developing country like India where there is a high prevalence of malignancy of lungs granulomatous diseases like tuberculosis. In conclusion, EBUS-TBNA allows real-time aspiration of peri-bronchial or paratracheal lesions, and can be done under conscious sedation or general anesthesia. EBUS- TBNA will play an increasingly important role in diagnosing, staging, and managing both benign and malignant diseases with high sensitivity, specificity, and diagnostic accuracy. EBUS- TBNA can be used as a standard initial tool for diagnosing paratracheal/peri-bronchial mediastinal/lung lesions. EBUS-TBNA should be used as a standard initial test.

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