

## DIAGNOSTIC YIELD OF TRANSBRONCHIAL NEEDLE ASPIRATION– ANALYSIS OF 30 CASES

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**Background:** In our clinical set up transbronchial needle aspiration of lymph node and parenchymal lesions is an underutilized technique. This study was done to highlight the usefulness of this technique in the pulmonologists armamentarium. **Methods:** Thirty procedures were performed on patients with intrathoracic lymphadenopathy or parenchymal lung lesions in this study from October, 2006 to April, 2007. Patients with an easily accessible peripheral lymph node, bleeding diathesis and an already confirmed diagnosis were excluded from the study as were patients with a well visualized biopsiable endobronchial lesion. **Results:** Nineteen patients (63.3%) on whom transbronchial needle aspirations were performed had intrathoracic lymphadenopathy while 11 (36.6%) had parenchymal lesions without endobronchial lesions which could be biopsied. Adequate samples were obtained in 23 patients (76.6%) chronic granulomatous inflammations which was diagnosed as tuberculosis in corroboration with other clinical and laboratory evidence was seen in 3 cases (10%). Carcinoma was diagnosed in 6 cases (20%). Thirteen cases (43%) were reported as normal and inadequate samples were obtained in 7 cases (23%). **Conclusion:** Transbronchial Needle Aspiration (TBNA) is an effective method of obtaining cytological material from intrathoracic lymph nodes and parenchymal lesions and can provide a safe alternative to invasive mediastinotomy/mediastinoscopy and open lung biopsy.

**Keywords:** Transbronchial needle aspiration, intrathoracic lymphadenopathy, parenchymal lung lesion.

### INTRODUCTION

Trans Bronchial Needle Aspiration (TBNA) is a valuable technique for sampling mediastinal lymphnode and pulmonary parenchymal lesion. The diagnostic yield of TBNA varies widely in reported cases ranging from 20–90%.<sup>1-7</sup> It is a safe, cheap and minimally invasive procedure, performed via a flexible bronchoscope with various sizes of retractable needles which are introduced through the suction port of the bronchoscope. Indications for TBNA are any enlarged lymph node lining the trachea or main bronchi or a parenchymal lesion abutting the main or segmental bronchi out lined by a CT scan or X-Ray chest. The gold standard for histologic diagnosis is mediastinoscopy, mediastinotomy or an open lung biopsy however these procedures are invasive and complications can be serious.<sup>8</sup> It is an underutilized procedure<sup>9</sup>, since its introduction in 1949<sup>10</sup>, which if adopted can help in early diagnosis and reducing patient morbidity and mortality. There is hardly any data available in our country validating the usefulness of transbronchial needle aspiration biopsy in patients of intrathoracic lymphadenopathy and parenchymal lung lesions. Therefore the present study was planned so that the procedure could be strongly recommended to bronchoscopists in our clinical set up as well. The objective of this cross study was to evaluate the Trans Bronchial Needle Aspiration biopsy in our setup as a diagnostic tool for various pulmonary diseases.

### MATERIAL AND METHODS

Mediastinal and/or hilar lymphadenopathy or parenchymal lesions were identified on the basis of chest CT scan or X-Rays. All patients were pre assessed before the procedures with blood complete picture, platelets, prothrombin time, activated partial thromboplastin time, ECG, Mantoux test, sputum for AFB, X-Rays chest PA and lateral view and/or CT scan chest. This study was done in Military Hospital Rawalpindi from October, 2006 to April, 2007

TBNA was performed with a 21 gauge (Wang) needle. (Olympus NA-1C-1) using fiberoptic bronchoscope (Olympus BF type P40) under topical anaesthesia 2% lignocaine and conscious sedation with midazolam in the standard fashion (12) with samples from endobronchial or endotracheal locations. After identification of the most accessible target area on CT or endobronchial picture of pressure effects, the needle was positioned at the target site. A 20 ml syringe was connected to the catheter and the needle was introduced into the node using the jabbing technique. After penetration suction was applied with the syringe. In an attempt to free individual cells and/or tissues the catheter was jabbed up and down under different angles under continuous suction. After a few thrusts usually 4–8 times, suction was released and the needle pulled back into the catheter. Subsequently the catheter was removed from the bronchoscope. Direct smear technique was used for preparation of TBNA specimens. The specimen was smeared on a glass slide

applying pressure from the same syringe immediately covered with a second slide and while exerting gentle continuous pressure the slides were drawn apart and fixed with 95% alcohol. All slides were stained using standard Giemsa and standard papanicolau methods.

A positive TBNA was defined as that yielding granuloma, dysplastic cells, or specific cancerous material. Adequate but normal lymph node specimens were defined as those demonstrating lymphoid tissue on cytological specimens with out other abnormal cells. TBNA was considered to be non-diagnostic if no representative cells were obtained.

Statistical analysis was performed with SPSS 10. Chi-square test was used for comparison of diagnostic yields in the two conditions, i.e., intrathoracic lymphadenopathy and parenchymal lung lesion.

## RESULTS

Adequate lymph node samples were obtained in 23 of 30 patients (76.6 %) and a definite diagnosis was made in 09 of 30 patients (30 %). TBNA was the only diagnostic tool in all these patients & TBNA was done in one location in all cases. The diagnosis was tuberculosis in 03 patients, (10 %). 02 patients of tuberculosis had intrathoracic lymphadenopathy as the sole feature and 01 patient of tuberculosis had parenchymal defects causing endobronchial pressure effects. Cancer was diagnosed in 06 patients (20 %). Out of these 06 patients Adenocarcinoma was diagnosed in 02 patients, squamous cell carcinoma in 01 patient, a diagnosis of non small cell carcinoma, metastatic carcinoma and only “carcinoma” in one case each. 13 adequate samples were reported as negative and 7 samples were inadequate for cytology.

Nineteen (63.3 %) of the whole 30 cases had lymphadenopathy amongst which adequate samples were obtained in 12 cases (63 %). 2 cases (10.5%) at carcinoma, 2 (10.5%) had chronic granulomatous inflammation. 8 cases (42.1%) were reported normal and in 7 cases (36.8%) the samples obtained were inadequate.

Eleven (11) of the whole 30 cases (36.6%) had parenchymal lesions without endobronchial extension. TBNA was done from sites of endobronchial pressure effects as seen on bronchoscopy. Adequate samples were obtained in all 11 cases (100%). Five (5) cases (45.4%) had carcinoma, 1 case (9.0%) had chronic granulomatous inflammation and the rest of 5 cases (45.4%) were reported normal.

4-6 attempts were made in each case. The average no of attempts in the adequate samples were 4.4 (The average no of attempts in those with a positive definite diagnosis was 5.3 and the average no of attempts in case of adequate but negative samples was 5.2). the average no of attempts in case of inadequate samples was 4.0.

The diagnostic yield in case of peripheral parenchymal lung lesion (100%) was significantly higher as compared to intrathoracic lymphadenopathy (63.3%) ( $p=0.021$ )

**Table-1: Distribution of Patients according to diseases diagnosed by Transbronchial Aspiration Biopsy (n=30)**

	P	T	Ch	Gr	N	%
Lymphadenopathy	2	2	8	7	19	63 %
Parenchymal lesion	1	5	5	0	11	100%

\*Diagnostic yield was significantly higher in Parenchymal lesions as compared to Lymphadenopathy,  $p=0.021$

## DISCUSSION

TBNA is a valuable technique for sampling mediastinal and pulmonary lesions. It was first described in 1949.<sup>10</sup> The diagnostic yield of TBNA varies widely in reported cases ranging from 20 to 90%.<sup>1-6</sup>

The experience with cytologic studies obtained with TBNA is limited both in HIV negative and positive patients with tuberculosis.<sup>7,13-16</sup> Tuberculosis is the commonest cause of intra thoracic lymphadenopathy<sup>12</sup> in previous studies. In our study 2 of the 19 cases with intra thoracic lymphadenopathy (10.5%) had tuberculosis and 2 of these 19 cases (10.5%) had cancer. CT fluoroscopy guided TBNA has been found to be very successful in lymph node stations that are less easily accessibly.<sup>17</sup> In our study blind TBNA was utilized, and our results were satisfactory with 76.6% adequate samples and positive diagnosis in 30%, and the rest of the samples were adequate but normal. In previous studies by Harrow and colleagues the diagnostic yield of TBNA was 18% in mediastinal lymphadenopathy due to cancer. In another study by Gay and colleagues the diagnostic yield for similar condition was 37%. Cetinkaya and colleagues have reported diagnostic yield of 76% in case of mediastinal lymphadenopathy. Various previous studies have utilized 18, 19 and 22 gauge needles.<sup>1,8,15,16,18</sup> We utilized 21 gauge needle with satisfactory results.

The usual method of obtaining diagnostic tissue in sarcoidosis is Tranbronchial biopsy, however it carries significant complications.<sup>7</sup> There are reports on the diagnostic value of TBNA with 18 and 19 gauge needles in sarcoidosis.<sup>18-22</sup>

TBNA can be utilized in staging and diagnosis of lung carcinoma.<sup>15,16,19,23,24</sup> The false positive results of TBNA in cytologic specimens are very low.<sup>5,21</sup> In our study the diagnosis of cancer was made in 06 patients out of total 30 patients (20%) and tuberculosis in 3 out of total 30 patients (10%). The addition of cytologic specimen to histologic specimen therefore may increase the diagnostic yield.

The number of samples with a positive diagnosis was 21% (4 cases out of 19) in case of mediastinal lymphadenopathy and 45.4 % (5 cases out of 11) with peripheral parenchymal lesions in our study. The rate of successful procedures in our study was higher with peripheral parenchymal lung lesions (100%) than with intrathoracic lymphadenopathy (63 %).

Directly prepared and smeared TBNA specimens provide better results than those expelled into alcohol for use in laboratory.<sup>25</sup> We followed the above in our own study.

TBNA is a safe procedure<sup>26</sup> while trans bronchial biopsy raises the risk of major complication 10–20 fold.<sup>8,9</sup> No post-procedure complication was observed in our study.

## CONCLUSION

It can be concluded that transbronchial needle aspiration biopsy is a useful procedure for the diagnosis of various lesions of the mediastinal lymph nodes and lung parenchyma. Hence transbronchial needle aspiration may prove an alternative to open lung biopsy, mediastinotomy/mediastinoscopy procedures particularly in patients who are unfit to under go this major invasive procedure.

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