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Research Article

Diagnostic Utility of Trans-Bronchial Needle Aspiration for Mediastinal Lymphadenopathy- Our Experience

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Abstract: Transbronchial needle aspiration through flexible bronchoscopy is a simple, safe and cost effective procedure for the diagnosis of various mediastinal lesions, can be performed on out-patient basis in selected patients without hospital stay and without complications. We evaluated the diagnostic yield of transbronchial needle aspiration in various mediastinal lesions without lung parenchymal involvement in our setting. All patients suffering with fever cough, having mediastinal lymphadenopathies on chest radiograph and contrast chest CT scans were included. TBNA was performed through flexible bronchoscope to obtain samples from mediastinal lymphadenopathies. As we have excluded endobronchial mass lesions the bronchoscpic findings were classified as carina and Sub carinal widening, altered mucosa and extrinsic compression. In results a total 30 patients with mediastinal lymphadenopathies were studied. The Diagnostic Yield was 60% (18/30). Definite diagnosis with cytology was reached in 18 patients, 17 (56.6 %) patients had inflammation and 1 (3.3%) malignancy. None of our patient has experienced any significant complications. In the present study, we conclude that adequate cytological material was obtained successfully in 86.6% patients and the diagnostic yield was 60 %. In the hands of experienced bronchoscopist and with a good laboratory backup the diagnostic yield can be further improved.
Keywords: Transbronchial needle aspiration, Bronchoscopy, Cytology.

INTRODUCTION

Transbronchial needle aspiration through flexible bronchoscopy is a simple, safe and cost effective procedure for the diagnosis of various mediastinal lesions, can be performed on out-patient basis in selected patients without hospital stay and without complications. Transbronchial needle aspiration (TBNA) is a minimally invasive flexible bronchoscopic technique which can be employed to obtain tissue samples from mediastinal lymph nodes or peribronchial locations [1,2]. TBNA may be used to sample tissue from endobronchial tumors, sub mucosal lesions and tumors adjacent to the central airways, particularly when resulting in extrinsic compression of the airway. Peripheral lung tissue may be sampled using this technique; for example, peripheral lung nodules or masses. TNBA is safe, reliable and cost effective for diagnosis of intra thoracic lymphadenopathies. The value of TBNA as a means for diagnosis of intra thoracic lymphadenopathies and also staging of lung cancer has been approved and confirmed in various studies [3, 4, 5, 6]. The diagnosis of mediastinal lymphadenopathies without parenchymal involvement of lung is often difficult [7]. We evaluated the diagnostic yield of transbronchial needle aspiration in various mediastinal lesions without lung parenchymal involvement in our setting.

METHODOLOGY

This Clinical study was conducted in bronchoscope unit of Government General and Chest Hospital Hyderabad, over a period of 18 months from December 2010 to May 2012. The study was commenced after obtaining approval from the institution's ethical committee. Informed consent was obtained from the patient before enrolling into the study. All patients suffering with fever cough, having mediastinal lymphadenopathies on chest radiograph and contrast chest CT scans were included. Patients below 18 years and above 80 years of age, or Sputum positive.

AFB, or having associated lung lesions other than lymphadenopathies or having malignancies or with severe respiratory or cardiac failure or seropositive for HIV infection were excluded. All patients underwent thorough screening clinically, biochemically and by electro-cardiographs. A total of 30 patients who satisfied entry criteria underwent transbronchial needle aspiration to find out the cause of mediastinal lymphadenopathies. TBNA is a technique of inserting a aspiration needle blindly through the bronchial wall into an enlarged lymph node and aspirating material. Available contrast CT scan chest and radiographs were used to determine the sites for puncture during TBNA. TBNA through flexible bronchoscope Olympus BF type 40 OR Fujinon 21 gauge were used to obtain samples from mediastinal lymphadenopathies. Endo-bronchial lesions were classified as sub mucosal infiltration, extrinsic compression, endobronchial mass and mucosal irregularity during bronchoscopic examination. As we have excluded endobronchial mass lesions the bronchoscpic findings were classified as carina and Sub carinal widening, altered mucosa and extrinsic compression.

Statistical Analysis

Data was entered into Excel Spread Sheet 2007. Data was then cleaned, mined and extracted using if and sort functions. Data was described as actual numbers and percentages for categorical variables and Mean & SD for continuous variables.

RESULTS

A total 30 patients with mediastinal lymphadenopathies were studied. Most (43%) of the patients were between 18 to 27 years.There were 13 (43%) male patients and 17 (57%) female patients. Majority(36.6%) were students followed by 23% daily wage labours and 23.3% house wives. The most frequent symptom was cough, followed by chest pain, weight Loss, fever, breathlessness, coughing out of blood, and all had generalized weakness, anorexia. 2 (6.67 %) patients revealed that their sister had suffered with pulmonary tuberculosis, as a family history. 19 patients (63.33%) were chronic smokers and 11(36.6%) patients were non-smokers. In 21/30 (70%) of patients ESR significantly raised above 40 mm/hr.80 % of patients had leukocyte count in 7800 to 10800 range where as remaining 20% of patients had leukocyte count more than 11000. 63.3% (19/30) were mantoux positive. The most common site of lymph node involvement on CECT chest was Sub carinal area which was noted in 7 patients(23.33%) , followed by right paratracheal in 6 (20%)patients and multiple nodal involvement seen in remaining 7 patients. (Table-1) Majority 17/30 (56.6%) patients had lymph node size more than 2cm on contrast CT scan of chest. The most common bronchoscopic finding was extrinsic compression in 11(36.66%) patients, followed by altered mucosa & extrinsic compression in 6(20%) patients, altered mucosa in 6(20%) patients, widening of carina and secondary carina in 4 (13.33%) patients. Adequate cytological sample and diagnosis was obtained in 46.66% patients with lymph node size more than 2cm on CECT chest and 13.33% for lymph node size 1cm to 2cm. The Diagnostic Yield was 60% (18/30). Definite diagnosis with cytology was reached in 18 patients, 17 (56.6 %) patients had inflammation and 1 (3.3%) malignancy. (Table-2) None of our patient has experienced any significant complications.

DISCUSSION

Transbronchial needle aspiration (TBNA) is a minimally invasive technique to facilitate the diagnosis of mediastinal pathology by enabling intra thoracic nodal sampling in through a rigid or flexible bronchoscope [8, 9]. There are many causes of mediastinal lymphadenopathies including infection, neoplasm, granulomatous disease and reactive hyperplasia. Chest radiographs and contrast computed tomography of chest have become the standard technique for demonstration of mediastinal Lymphadenopathy. Fibre-optic bronchoscopy with transbronchial needle aspiration is a widely accepted technique for the diagnosis of various mediastinal lesions. However, the diagnostic yield of TBNA varies widely from 20–90% [10]. In our study, TBNA samples were adequate in 26 patients (86.6%). Definite diagnosis with cytology was reached in 18 patients, 17(56.6 %) patients had inflammation in which 15 cases were TB lymphadenitis, 2 cases were suppurative inflammation and 1 (3.3%) malignancy. In a study by How and colleagues on 25 patients, TBNA was positive in 15 patients (60%). Whereas Lannes *et al.*;[11] on 74 patients, 46% of samples were adequate and diagnostic. Cetinkaya and colleagues noted Lymph node samples were adequate in 59 out of 60 samples and the diagnosis were made in 45 out of 60 patients (75 diagnoses included 21 patients of TB, 21 patients of sarcoidosis, 15 patients of carcinoma and 3 patients of lymphoma %)[50]. In Hamid Reza Jabbar study [12] patients were evaluated and a definite diagnosis was reached in 22 patients. The most common diagnosis was malignant lesions and atypias in 11 patients (50%), followed by sarcoidosis in 8 (36.36%), TB in 2 (9.09%) and other diagnoses in 1 (4.55%). The present study has a diagnostic yield of 60%, which is comparable with other studies.

Table-1-Clinical Radiological and Bronchoscopic features

	Total	%
Presenting symptoms		
Fever, cough, weight loss	7	23.3
Fever, cough, weight loss, chest pain	2	6.7
Fever, cough, chest pain	2	6.7
Fever, weight loss, chest pain	3	10.0
Fever, chest pain, dyspnea	1	3.3
Cough, weight loss, chest pain	4	13.3
Cough, weight loss, chest pain, dyspnea	1	3.3
Cough, weight loss, dyspnea	3	10.0
Cough, chest pain, dyspnea	5	16.7
Cough, chest pain, dyspnea, coughing out off blood	1	3.3
Cough, chest pain, coughing out off blood	1	3.3
Grand Total	30	100.0
CECT CT Chest – Predominant Patterns		
Right par tracheal	6	20
Left para tracheal	1	3.3
Sub carinal	7	23.3
Right hilar	1	3.3
Left hilar	3	10
Pre vertebral	1	3.3
Right para tracheal, Sub carinal	2	6.6
Right para tracheal, Sub carinal, Right hilar	1	3.3
Right para tracheal, Sub carinal, Right hilar, Pre vertebral	1	3.3
Left para tracheal, Sub carinal	1	3.3
Sub carinal, Right hilar	1	3.3
Sub carinal, Right hilar, Left hilar	1	3.3
Right hilar, Left hilar	4	13.3
Grand Total	30	100
Bronchoscopic (FOB) findings		
Altered mucosa	6	20
Extrinsic compression	11	36.6
Widening of carina / secondary carina	4	13.33
Altered mucosa, extrinsic compression	6	20
Altered mucosa, widening of carina / secondary carina	2	6.66
Extrinsic compression / widening of carina / secondary carina	1	3.33
Total	30	100

Table-2- TBNA Tissue Sample Adequacy Vs. Size of mediastinal lymph node Vs. Histological features

	Lymph Node Size		
	< 2 cm	>2cm	Total
Adequate diagnostic(Inflammation=17, Malignancy=1)	4	14	18
Adequate non-diagnostic (Normal cytology=8)	6	2	8
Inadequate non-diagnostic	3	1	4
Total	13	17	30

Table-3- Comparison of diagnostic yield of TBNA Tissue Sample across various studies

Studies	No. of patients	Diagnostic yield
Rai&Bhattacharyya [16]	48	31.25%
Hamid Reza JabbarDarjani [12]	39	56.4%
Muhammad Khalid Azam Khan [10]	30	30%
Lannes *et al.; [16]*	74	46%
Cetinkaya[17]	60	45%
Pinar Yildiz *et al.;* [18]	60	75%
K Yasufuku and colleagues [19]	25	60%
Present study	**30**	**60%**

COMPLICATIONS

TBNA is a very safe procedure, particularly when performed properly by physicians experienced in bronchoscopy. The most commonly described complications include bleeding, pneumothorax, pneumo mediastinum and post-procedure fevers. In reviews of TBNA studies, the overall major complication rate, including bleeding, pneumothorax and pneumo mediastinum, was 0.26 percent. This included two major bleeds and one pneumothorax requiring intervention [13]. However, serious adverse effects are much less frequent when compared with those from transbronchial biopsy or surgical biopsy. A study conducted by Alberto Fernández-Villar [14] in 580 patients, Complications related to TBNA occurred in 12 patients (2.1%), 11 patients of mild to moderate, self-limited bleeding at the puncture site and one case of pneumo mediastinum and subcutaneous emphysema . In Holty *et al.;* [15] study the complication rate was 0.3 %. Present study consists of 30 patients and no significant complications were noted.

CONCLUSION

Transbronchial needle aspiration through flexible bronchoscopy is a simple, safe and cost effective procedure for the diagnosis of various mediastinal lesions, can be performed on out-patient basis in selected patients without hospital stay and without complications. In the present study, adequate cytological material was obtained successfully in 86.6% patients and the diagnostic yield was 60 %. In the hands of experienced bronchoscopist and with a good laboratory backup the diagnostic yield can be further improved.

REFERENCES

1. Xia Y, Wang KP; Transbronchial needle aspiration: where are we now? Journal of Thoracic Disease. 2013; 5(5):678-82.
2. Walia R, Madan K, Mohan A, Jain D, Hadda V, Khilnani GC, *et al.;* Diagnostic utility of conventional transbronchial needle aspiration without rapid on-site evaluation in patients with lung cancer. Lung India: Official Organ of Indian Chest Society. 2014; 31(3):208-11.
3. Ernst A, Anantham D, Eberhardt R, Krasnik M, Herth FJ; Diagnosis of mediastinal adenopathy—real-time endobronchial ultrasound guided needle aspiration versus mediastinoscopy. Journal of thoracic oncology. 2008; 3(6):577-82.
4. Eberhardt R, Anantham D, Ernst A, Feller-Kopman D, Herth F; Multimodality bronchoscopic diagnosis of peripheral lung lesions: a randomized controlled trial. American journal of respiratory and critical care medicine. 2007; 176(1):36-41.
5. Ernst A, Eberhardt R, Krasnik M, Herth FJ; Efficacy of endobronchial ultrasound-guided transbronchial needle aspiration of hilar lymph nodes for diagnosing and staging cancer. Journal of Thoracic Oncology. 2009; 4(8):947-50.
6. Herth FJ, Ernst A; Innovative bronchoscopic diagnostic techniques: endobronchial ultrasound and electromagnetic navigation. Current opinion in pulmonary medicine. 2005; 11(4):278-81.
7. Baran R, Tor M, Tahaoğlu K, Ozvaran K, Kir A, Kizkin O, *et al.;* Intrathoracic tuberculous lymphadenopathy: clinical and bronchoscopic features in 17 adults without parenchymal lesions. Thorax. 1996; 51(1):87-9.
8. Bilaceroglu S, Chhajed P; Transbronchial needle aspiration: a diagnostic tool in routine bronchoscopy. JAPI. 2005; 53.
9. Navani N, Molyneaux PL, Breen RA, Connell DW, Jepson A, Nankivell M, *et al.;* Utility of endobronchial ultrasound-guided transbronchial needle aspiration in patients with tuberculous intrathoracic lymphadenopathy: a multicentre study. Thorax. 2011; 66(10):889-93.
10. Khan M, Ansari JK, Saeed W, Zaman F, Naseem A, Baig IM, *et al.;* Diagnostic yield of transbronchial needle aspiration–analysis of 30 cases. J Ayub Med Coll Abbottabad. 2008; 20(3):132-4.
11. Lannes D, Monteiro AS, Toscano E, Cavalcanti A, Nascimento M, de Biasi P, *et al.;* Transbronchial needle aspiration of hilar and mediastinal lymph nodes. Revisit Portuguesa de Pneumologia (English Edition). 2007; 13(5):651-8.
12. Darjani HRJ, Kiani A, Bakhtiar M, Sheikhi N; Diagnostic yield of transbronchial needle aspiration

(TBNA) for cases with intra-thoracic lymphadenopathies. Tanaffos. 2011; 10(4):43.
13. Varela-Lema L, Fernandez-Villar A, Ruano-Ravina A; Effectiveness and safety of endobronchial ultrasound–transbronchial needle aspiration: a systematic review. European Respiratory Journal. 2009; 33(5):1156-64.
14. Fernández-Villar A, Leiro-Fernández V, Botana-Rial M, Represas-Represas C, Núñez-Delgado M; The endobronchial ultrasound-guided transbronchial needle biopsy learning curve for mediastinal and hilar lymph node diagnosis. CHEST Journal. 2012; 141(1):278-9.
15. Holty JC, Kuschner WG, Gould MK; Accuracy of transbronchial needle aspiration for mediastinal staging of non-small cell lung cancer: a meta-analysis. Thorax. 2005; 60(11):949-55.
16. Rai S, Bhattacharyya D, Choudhary R; Flexible bronchoscopy in the evaluation of mediastinal and hilar lymphadenopathy. Medical Journal Armed Forces India. 2007; 63(1):26-8.
17. Cetinkaya E, Yildiz P, Altin S, Yilmaz V; Diagnostic value of transbronchial needle aspiration by Wang 22-gauge cytology needle in intrathoracic lymphadenopathy. CHEST Journal. 2004; 125(2):527-31.
18. Cetinkaya E, Yildiz P, Kadakal F, Tekin A, Soysal F, Elibol S, *et al.;* Transbronchial needle aspiration in the diagnosis of intrathoracic lymphadenopathy. Respiration. 2002; 69(4):335-8.
19. Yasufuku K, Chiyo M, Sekine Y, Chhajed PN, Shibuya K, Iizasa T *et al.;* Real-time Endobronchial Ultrasound-Guided Transbronchial Needle Aspiration of Mediastinal and Hilar Lymph Nodes*. CHEST Journal. 2004; 126(1):122-8.