Flexible Bronchoscopy in the Evaluation of Mediastinal and Hilar Lymphadenopathy

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Abstract

Background : The diagnosis in cases of mediastinal and/or hilar lymphadenopathy with no lung parenchymal involvement is often difficult. We undertook this study to assess the diagnostic value of flexible bronchoscopy (FOB) especially transbronchial needle aspiration (TBNA) and transbronchial lung biopsy (TBLB) in these patients.

Methods : Forty eight patients with hilar and/or mediastinal lymphadenopathy without any parenchymal lung lesions, managed between 2000 to 2004 at a tertiary care centre who underwent FOB were evaluated retrospectively.

Results : Out of 48 patients, FOB showed widening of carina in six, widening of secondary carina in four, bulge in airways because of extrinsic compression in seven and endobronchial nodule in two patients. It was normal in rest 29 patients. TBNA was done in all patients and TBLB in 13 patients where clinico-radiologic findings were consistent with stage 1 sarcoidosis. FOB established diagnosis in 18 patients (caseating granuloma in eight, noncaseating granuloma in nine, and AFB culture positive in one). It was inconclusive in other patients. One patient developed pneumothorax requiring intercostal tube drainage.

Conclusion : FOB especially TBNA has an important role in the diagnosis of hilar and mediastinal lymphadenopathy and should be considered before other invasive procedures.

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Key Words : Flexible bronchoscopy; Mediastinal lymphadenopathy; Hilar lymphadenopathy; Transbronchial needle aspiration; Transbronchial biopsy

Introduction

The diagnosis in cases of mediastinal and hilar lymphadenitis without parenchymal involvement of lung is often difficult. There are many causes of mediastinal and hilar lymphadenopathy, including infection, neoplasm, granulomatous disease and reactive hyperplasia [1-3]. Chest radiographs and computed tomography (CT) have become the standard technique for demonstration of mediastinal and hilar lymphadenopathy [1-3]. However, in many cases, biopsy is required to establish the specific diagnosis. Flexible bronchoscopy using Transbronchial Needle Aspiration (TBNA) and Transbronchial Lung Biopsy (TBLB) has an important role in the diagnosis of mediastinal [2,4-6] and hilar lymphadenopathy and should be considered before mediastinoscopy and diagnostic thoracotomy.

Material and Methods

Forty eight patients with hilar and/or mediastinal lymphadenopathy without pulmonary abnormalities treated between 2000 to 2004 were evaluated. All the patients had a standard chest radiograph to determine lymphadenopathy. CT scan was available in forty five patients, which helped in defining the mediastinal lymph nodes and guiding TBNA.

Tuberculin test with 5TU-PPD, human immunodeficiency virus (HIV) serology and pulmonary function testing were done in most of the patients. All patients underwent flexible bronchoscopy with TBNA using 21 gauge (21 G NA-2C-1) aspiration needles through Olympus BF Type 40 bronchoscope. Once bronchoscope reached the target area, the needle was advanced and inserted into the target lymph node puncturing the tracheobronchial wall perpendicularly [5]. The exact sites of aspiration for TBNA [2,4-6] were determined by endobronchial abnormality (endobronchial lesions, bulge because of extrinsic compression and widening of carina). In cases where there was no endobronchial abnormality, site of aspiration was determined by CT scan results. With the needle inserted suction was applied at proximal port using a 10 ml syringe. The needle was then withdrawn from the target site after releasing suction. The contents of the needle were expelled by using air from the 10ml syringe and smears were made. The smears were fixed immediately in 95% alcohol. Patients thought to have clinico-radiological finding consistent with sarcoidosis in the form of bilateral symmetrical hilar lymphadenopathy underwent TBLB in addition to TBNA. After lodging the bronchoscope in middle or lingual lobe, biopsy forceps was passed beyond the segmental bronchi into lung and biopsy was taken. Bronchoalveolar lavage (BAL) was taken by instilling 50ml

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of normal saline into middle lobe or lingula in all cases. Lavage samples were submitted for cytology, acid fast bacilli (AFB) smears and culture examination. The clinical information, radiological findings and results of bronchoscopic procedures were analyzed.

Results

Bronchoscopy showed abnormality in 19 out of 48 patients (widening of carina in six, widening of secondary carina in four, bulge into airways because of extrinsic compression in seven and endobronchial nodule in two patients). Out of two patients with endobronchial nodules, TBNA and biopsy confirmed caseating granuloma in one and non-caseating granuloma in other patient. Out of 48 patients, TBNA confirmed the diagnosis in 15 (31.25%). It showed caseating granuloma in eight and non caseating granuloma in seven patients suggesting the diagnosis of tuberculosis and sarcoidosis. Of the 13 patients, TBLB showed non-caseating granuloma in two (15.4%) patients and AFB was grown in one (2.08%) patient on BAL. None of the patients showed malignancy/lymphoma. Overall bronchoscopic procedures established diagnosis in 18 (37.5%) patients. Minor bleeding was encountered in three patients after TBNA, which was controlled with local instillation of adrenaline. One patient developed pneumothorax after TBLB, which was managed by intercostals tube drainage.

Discussion

Mediastinal and/or hilar lymphadenopathy without parenchymal lesions in adult are unusual and make the diagnosis using noninvasive techniques difficult. There are many causes of mediastinal and hilar lymphadenopathy, including infection, neoplasm, granulomatous disease and reactive hyperplasia [1,2,3]. Infection consists predominantly of tuberculosis and fungal infection. The neoplastic causes include lymphoma, leukemia, metastatic carcinoma from lung cancer, cancer of oesophagus and breast cancer. Sarcoidosis is a common cause of intrathoracic lymphadenopathy.

Short axis diameter of lymph node exceeding 1-2 cm indicates a significant abnormality [1,2]. Bilateral symmetrical hilar lymphadenopathy is typical of sarcoidosis, where as it is bilateral but asymmetrical in lymphoma. Bilateral hilar lymphadenopathy in elderly could be due to small cell carcinoma. Unilateral hilar lymphadenopathy could be due to tuberculosis in the young and metastases from bronchogenic carcinoma in older people. The diagnosis of tuberculosis is suggestive on CT scan by low attenuation nodes with ring enhancement and calcification [1-3].

Although bronchoscopy has been useful in the early diagnosis of endobronchially visible tumors, it has limitations in diagnosing extra-bronchial disease and mediastinal lymphadenopathy. The technique of TBNA was developed in the early eighties to obtain cytological

and histological samples from the hilar or mediastinal lesions [4-7]. TBNA is useful in the diagnosis of endobronchial lesion because it causes less bleeding than brushing or biopsy. As per Dasgupta et al [8], TBNA provides diagnosis in 95.6% of patients with endobronchial lesions, surpassing the combined yield of washing, brushing and biopsy. Subsequently various workers have reported the usefulness of TBNA, even in the absence of an endobronchial disease [7]. Different techniques had been described for tracheobronchial wall penetration by TBNA [5]. The value of TBLB in diffuse pulmonary lesions of probable sarcoid aetiology is well established [2,6], although its yield in stage I disease is reported to be not as high as when parenchyma involvement is radiologically evident. Some workers have reported presence of non-caseating granuloma on transbronchial biopsy of lung even in stage I sarcoidosis [9]. According to Trisolini et al [10], TBNA was diagnostic in 72% patients. The association of TBNA and TBLB increased the diagnostic yield to 87% in these patients. As per Morales [11], TBNA established diagnosis in 53% of patients with stage I sarcoidosis. Leonard et al [12], combined the techniques of TBLB, BAL and TBNA for diagnostic sensitivities of 100% in sarcoidosis. TBNA has also been found useful in the diagnosis of mediastinal mycobacterial lymphadenopathy [13-17]. CT scan guided TBNA in these cases had 83% sensitivity and 100% specificity [18].

In this study an attempt was made to evaluate the usefulness of TBNA and TBLB in the diagnosis of mediastinal and or hilar lymphadenopathy. In our series TBNA confirmed the diagnosis in 31.25% patients, which is lower than reported by other workers (45-60%) [2,5-7]. The difference is possibly because of patient selection criteria and the lack of facilities for CT or sonographic guidance while doing TBNA. CT guidance can increase its sensitivity and specificity [18]. As per Diette et al [19], the availability of rapid on site evaluation of samples by a cytopathologist improved the diagnostic yield when sampling hilar and mediastinal lymphadenopathy. Endoscopic ultrasound-guided fine needle aspiration has shown to improve the results [20]. Endobronchial ultrasound (EBUS) can detect mediastinal lymph nodes down to a size of 2-3 mm and results of TBNA can be significantly improved up to 90% [21].

Most of our patients were young serving soldiers, hence we did not find any case of malignancy or lymphoma. TBLB was positive in only 15.4% patients. Low diagnostic yield is possibly because patients with parenchymal involvement were not included in this study.

We conclude that bronchoscopy with TBNA and TBLB has an important role in diagnosis of mediastinal and hilar lymphadenopathy. The procedure is safe,

inexpensive and can be performed easily during a routine diagnostic bronchoscopy, obviating the need for mediastinoscopy and diagnostic thoracotomy.

Conflicts of Interest

None identified

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