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Role of Fiber Optic Bronchoscopy in the Diagnosis of Various Lung Diseases

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Abstract
Background: *Fiber optic bronchoscopy (FOB) is a safe and useful diagnostic tool for the management of the pulmonary diseases.* ***Objectives****: To assess the role of FOB in the diagnosis of various lung diseases.* ***Materials and methods****: This retrospective study was conducted in the at a tertiary care institute of North India over a period one year (Jan-Dec 2010). Data was collected from hospital record regarding age, clinical presentation, diagnostic procedure and outcome. The study was carried out on 157 patients suspected to have pneumonia, pulmonary tuberculosis, lung cancer or sarcoidosis. All the patients were subjected to FOB.* ***Results:*** *There were total 157 cases included in the study and subjected to FOB. Majority (59.87%) were males, the mean age was 50 years with range from 21-80 years. The overall diagnostic yield of FOB was 61.14%. Conclusion: FOB can be successfully employed for the diagnosis of lung diseases, including malignancies and granulomatous lesions. Routine flexible bronchoscopy technique continues to have a good diagnostic yield in current clinical practice in various lung diseases.*

Key Words*: Fiber Optic Bronchoscopy, Lung Disease, Pulmonary Tuberculosis*

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I. Introduction

The advent of flexible Fiber Optic Bronchoscope in 1965 revolutionized the field of Pulmonary Medicine and proved itself as a safe and useful technique for diagnostic and therapeutic purposes. The Fiber Optic Bronchoscopy (FOB), has greatly enhanced the diagnosis and understanding of lung diseases and has evolved into the procedure of choice for diagnosis in pulmonary medicine.[1] It is a worldwide accepted procedure both for the diagnosis and treatment of various pulmonary disorders. FOB can be performed under local anesthesia in various clinic/hospital settings providing maximal visualization of tracheobronchial tree[2], and if performed carefully, can be a thoroughly safe procedure.[3]The samples can be collected by several methods like bronchial biopsies, bronchial brushings, aspiration, transbronchial lung biopsies, transbronchial needle aspirations and these combined advantages enhance the diagnostic value of bronchoscopy.[4] FOB is shown to be of diagnostic value in opportunistic pulmonary infections occurring in immune deficient patients including HIV positive patients, apart from its role in diagnosis of tuberculosis, lung carcinoma, pneumonia, interstitial lung diseases.[5] The initial step to diagnose a suspected case of Pulmonary tuberculosis is to isolate M. tuberculosis in stained smears from clinical samples (i.e. expectorated sputum). Even after a thorough examination, a positive yield from sputum is around 16 to 50% from most centers. A large portion remains negative in spite of consistent clinical and radiological findings suggestive of Pulmonary tuberculosis.[6] FOB has significant role to diagnose tuberculosis in such sputum smear negative cases. This procedure is immensely useful for making a conclusive diagnosis of lung cancer, especially when there is an endo bronchial lesion, providing adequate tissue sample by endobronchial biopsy, bronchoalveolar lavage (BAL) or brush cytology.

II. Materials And Methods

This study, approved by institutional ethics committee, was conducted in the Department of Pulmonary Medicine, Government Medical College, Patiala over a period one year (Jan-Dec 2010). Data was collected from hospital record regarding age, clinical presentation, diagnostic procedure and outcome. The study was carried out on 157 patients suspected to have pneumonia, pulmonary tuberculosis, lung cancer or sarcoidosis. The detailed clinical history, physical examination and routine investigations were carried out in all the participants. All the patients were subjected to sputum examination acid-fast bacilli (AFB) staining, gram staining, culture/sensitivity, KOH staining, malignant cells, hematological examination and coagulation profile. Chest X-rays in both PA and lateral views were obtained in all the patients before the procedure to define the location of the lesion. CT scan of thorax was performed in some cases where lesion was too small /doubtful on x-ray chest. All the patients were then subjected to FOB after obtaining an informed consent from the patient. The patients with any contraindications to bronchoscopy such as coagulation disorders, thrombocytopenia, uremia, single lung and severe pulmonary hypertension etc were excluded. The procedure was carried out effectively with the patient Nil Per Orally for 4 to 6 hours. Nebulisation was done with 2% xylocaine via nebulizer Bronchoscopy was carried out under local anesthesia (2% lignocaine) via Olympus bronchoscope. Oxygenation was monitored throughout the procedure with pulse oximetry. Appropriate samples such as bronchoscopic aspirate, brushing and biopsy were obtained depending on the lesion after thorough evaluation of endobronchial tree. The samples were subjected to cytology and histopathology depending upon the clinical diagnosis and bronchoscopic findings. The sputum samples were also collected after bronchoscopy (Post FOB sputum) and sent for analysis. After the procedure, patients were observed for development of pneumothorax, hemorrhage, infection and cardiac arrhythmias for 24-48 hours. Proper disinfection of the bronchoscope in between use was mandatory.

III. Results

A total of 157 cases were included in the study and subjected to FOB. Male preponderance was observed (59.87%), mean age was 50 years with range from 21to 80 years. Clinical signs /symptoms were as described in **Table 1**. 96 patients were diagnosed with medical conditions as described in **Table 2**. In the diagnosed 96 patients, 2 patients had both pulmonary tuberculosis and lung cancer and 1 patient presented with Pulmonary tuberculosis along with fungal pneumonia. .

Table 1: Clinical Presentation of Patients

Clinical Features	%
Cough	84
Hemoptysis	26
Wheeze	20
Shortness of breath	58
Fever	40
Chest pain	58

Table 2: Diagnostic yield of FOB

Disease	Diagnosis by FOB
Tuberculosis	43(27.38%)
Cancer	29(18.4%)
Pneumonia	22 (14%)
Sarcoidosis	2(1.27%)
Total	96(61.14%)

IV. Discussion

A male preponderance was observed in our study (59.87%) with the mean age of 50 years with range from 21 to 80 years. Our finding that cough was the commonest indication (84%) for bronchoscopy is in harmony with other studies.[6,7,8].we found other clinical presentations as shortness of breath and chestpain 58% each which are in concordance with other researchers[8] who observed dyspnea 66.8% and fever 61.9%. 61of cases(38.8%) remained undiagnosed with Fiber optic bronchoscopy. It is observed that the diagnostic yield of FOB is 61.14%. Similar observations were also made by other researchers [1,9,10,11] who reported it to be 57%;51%;71% and 62% respectively. In the present study diagnosis of Pulmonary tuberculosis with FOB was obtained in 43 of the total cases (27.38%). Our result of Pulmonary tuberculosis in sputum smear negative for AFB cases with FOB are in agreement with other studies[1,7.8.12] which reported diagnosis of Pulmonary tuberculosis with FOB as 27%;24.8%;37.7% and 16.6%respectively.So FOB plays important role in diagnosis in sputum smear negative pulmonary tuberculosis patients. It was also observed that 18.4% were diagnosed as having malignancy which is compatible with others [12,13] ,23.3%,27% respectively**.** Bronchoscopy is a safe

and useful tool for making the diagnosis of a variety of pulmonary diseases like Bronchogenic carcinoma, pulmonary tuberculosis and some interstitial lung diseases.

V. Conclusion

FOB can be successfully employed for the diagnosis of lung diseases, including malignancies and granulomatous lesions. Routine flexible bronchoscopy technique continues to have a good diagnostic yield in current clinical practice in various lung diseases.

ABBREVIATIONS: Fiber optic bronchoscopy (FOB),Broncho Alveolar lavage (BAL), Acid-fast bacilli (AFB),Computed tomography (CT), Chronic obstructive pulmonary disease (COPD).

CONFLICT OF INTEREST: None

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