

Role of Fiberoptic Bronchoscopy in Establishing the Diagnosis of Various Lung Diseases in a Tertiary Care Hospital

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Abstract: Background: Fiber-optic bronchoscopy is a safe and useful diagnostic and therapeutic tool for the management of the pulmonary diseases. Materials and Methods: This Descriptive study was done to find out the demographic profiles, indications, bronchoscopic findings, and diagnosis of the patients who underwent bronchoscopic examination. 100 patients underwent bronchoscopies in the department of Pulmonary Medicine, LN Hospital for a period of one year. Results: Amongst the 100 patients, commonest indication of bronchoscopy was radiological opacity found in 80% of patients, followed by diffuse pulmonary infiltrates in 6% of patients. Most common clinical presentation of the patients was Cough (88%). Out of 100 patients, 72 (72%) were males and 28 (28%) were females. The age group of maximum patients was above 50 years. Mean age was 48.8 years. Out of 100 patients, 79% patients were smokers (present and past) and 21% were non-smokers. The most common finding on bronchoscopy was endobronchial growth found in about 45% of patients. On cytology, Malignancy was seen in 20% cases while in 13% patients' cytological analysis depicted suspected malignancy. On histopathological analysis, neoplastic changes were found in 22 (30.5%) cases while non neoplastic changes were found in 48.6% of cases that included Tuberculosis (13.8%), Pneumoconiosis (8.3%), Non-specific inflammation (18.05%), Sarcoidosis (6.94%), Aspergillosis (1.38%). Conclusion: Fiberoptic bronchoscopy is extremely useful in finding specific etiologies of various lung diseases.

Keywords: FOB (fiberoptic bronchoscopy), lung malignancy, Tuberculosis

1. Introduction

The introduction of the flexible bronchoscope by Dr. Ikeda in 1968 revolutionized bronchoscopy around the world. Initially, bronchoscopy was performed by surgical specialists with a rigid scope only in highly specialized centers, and the main indication was for therapeutic purposes. In the 1970s, flexible fiberoptic bronchoscopy (FFB) was learned by pulmonologists and surgical specialists and proved itself as a safe and useful technique for diagnostic and therapeutic purposes.

The flexible fiberoptic bronchoscopy (FFB), has greatly enhanced the diagnosis and understanding of lung diseases and has evolved into the most commonly used diagnostic procedure in pulmonary medicine¹. It is a universally accepted procedure both in the diagnosis and therapy of different pulmonary disorders. FOB can be performed under local anesthesia in various clinic/hospital settings providing maximal visualization of tracheobronchial tree², and if performed carefully, can be a thoroughly safe procedure.³ Samples can be collected by several methods like bronchial biopsy, bronchial brushing, aspiration, transbronchial lung biopsy, transbronchial needle aspiration and these combined advantages enhance the diagnostic value of bronchoscopy.⁴ Fiberoptic bronchoscopy (FOB) is shown to be of diagnostic value in opportunistic pulmonary infections occurring in immunodeficient patients including HIV positive patients, apart from its role in diagnosis of tuberculosis, lung carcinoma, pneumonia, interstitial lung diseases.⁵ FOB is immensely useful for making a conclusive diagnosis of lung cancer, especially when there is an endobronchial lesion, providing adequate tissue sample by

endobronchial biopsy, bronchoalveolar lavage (BAL) or brush cytology.

2. Materials and Methods

This Descriptive study was carried out on 100 patients suspected to have pneumonia, pulmonary tuberculosis or lung cancer attending the Outpatient department of LN Hospital, (Maulana Azad Medical College) New Delhi from January 2014 to January 2015. Patients who had undiagnosed opacities on chest radiographs in the form of consolidation, hilar mass, collapse and cavity etc were also included. 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), haematological examination, coagulation profile. Contraindications, if any were ruled out. 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 thorax was performed in some cases. All the patients were then subjected to fiberoptic bronchoscopy. Flexible bronchoscopy was performed with fiberoptic scope through transnasal route under topical anesthesia (2% lignocaine).

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. Samples were subjected to cytology and histopathology depending upon the clinical diagnosis and bronchoscopic findings.

3. Results

In the study, 100 patients underwent bronchoscopy and results were formulated. Amongst the 100 patients, commonest indication of bronchoscopy was radiological opacity found in 80% of patients, followed by diffuse pulmonary infiltrates in 6% of patients. Six patients presented with hemoptysis with normal X-RAY. In the remaining nine (9%) patients, bronchoscopy was done for evaluation of the cause of unexplained, persistent cough. TABLE 1

Table 1: Indications of Bronchoscopy

Indication of Bronchoscopy	NO	%
Opacity on X RAY (suspicion of malignancy)	80	80
Diffuse Pulmonary Infiltrates	6	6
Hemoptysis	5	5
Others (unexplained cough)	9	9

Out of 100 patients, 72 (72%) were males and 28 (28%) were females. The age group of maximum patients was above 50 years. Mean age was 48.8 years. Out of 100 patients, 79% patients were smokers (present and past) and 21% were non-smokers. Most common clinical presentation of the patients was Cough (88%). Hemoptysis, wheeze, shortness of breath were other common symptoms found in 40%, 23% and 62% of patients respectively. Fever and chest pain were other complaints found in 31% and 49% of patients respectively. Maximum patients presented with more than one symptom and some more than two symptoms. TABLE: 2

Table 2: Clinical Presentation of Patients

Clinical Feature	%
Cough	88
Hemoptysis	40
Wheeze	23
Shortness of breath	62
Fever	31
Chest pain	49

Bronchoscopy was performed and findings were tabulated. The most common finding on bronchoscopy was Endobronchial growth found in about 45% of patients. Endobronchial growth without suspected growth was found in 6% of patients. 11% of patients had features of non-specific inflammation on bronchoscopy. Bronchoscopy was normal in 8% of patients and inconclusive in about 30% of patients. TABLE 3

Table 3: Findings of Bronchoscopy

Bronchoscopic Findings	%
Endobronchial growth	45
Suspected growth (Endobronchial abnormality without obvious growth)	6
Non-specific inflammation	11
Inconclusive	30
Normal	8

Pathological examination of samples obtained while bronchoscopy was done in the hospital and all samples were subjected to cytological and histopathological analysis. On cytology, Malignancy was seen in 20% cases while in 13%

patient's cytological analysis depicted suspected malignancy. Cytology was inconclusive in 9 % of cases while no malignancy was detected in 58% of cases. TABLE 4

Table 4: Diagnosis on Cytology

Findings on Cytology	%
Malignancy Confirmed	20
Malignancy Suspected	13
Inconclusive	9
No Malignancy	58

Samples of 72 suspected patients were sent for histopathological analysis and results were tabulated. Out of 72 patients, 11.1% patients had normal histological results while the result was inconclusive in 5 (6.94%) patients. Neoplastic changes were found in 22 (30.5%) of cases while non neoplastic changes were found in 48.6% of cases that included Tuberculosis (13.8%), Pnemoconiosis (8.3%), Non-specific inflammation (18.05%), Sarcoidosis (6.94%), Aspergillosis (1.38%) .Inadequate sample was obtained in 2 cases (2.7%) Table 5

Table 5: Diagnosis on Histopathology

Findings on Histopathology	No (n=72)	%
Normal	8	11.1
Inconclusive	5	6.94
Neoplastic	22	30.5
Non-Neoplastic		
1) Tuberculosis	10	13.8
2) Pnemoconiosis	6	8.3
3) Non – specific inflammation	13	18.05
4) Sarcoidosis	5	6.94
5) Aspergillosis	1	1.38
Inadequate sample	2	2.7

4. Discussion

Of the total patients who had undergone bronchoscopy, majority 72 (72%) were males and 28 (28%) were females. The age group of maximum patients was above 50 years. Mean age was 48.8 years. Bronchogenic carcinoma was found to have association with increasing age of the patients.

In our study, radiological opacity was commonest indication for performing bronchoscopy keeping in mind suspected malignancy in the patients. It correlated with the studies conducted by Garg B et al⁶ and Jindal et al⁷

In the present study, Cough was the commonest indication (88%) for bronchoscopy, which is similar to a study conducted by Prakash UB et al⁸. Epidemiological studies suggest majority of patients with bronchogenic carcinoma have signs and symptoms of COPD.^{9,10}

The most common finding at bronchoscopy was endobronchial growth, seen in 45% of cases and 6% patients had suspected malignant growth on bronchoscopy and 30 cases (30%) had inconclusive reports. In our study, adequate tissue, sufficient for reporting, was obtained in 70 (98%) cases. These findings are in concordance with a study performed by Hansen et al¹¹ in which adequate tissue was obtained in 93% cases which substantiates the fact that with

FOB an adequate tissue can be attained and a diagnosis can be established in majority of the cases.

On histopathological analysis, non-neoplastic lesions constituted the majority in 35 patients (48.6%) and neoplastic in 30.5% cases. In other studies, Hansen et al¹¹ reported 31% cases of neoplastic category and 62% as non-neoplastic, Abdul Aziz et al¹² found 28% neoplasm and 72% cases were nonneoplastic disease

Out of 48.6% of non neoplastic conditions, Tuberculosis constituted (13.8%), Pnemoconiosis (8.3%), Non –specific inflammation (18.05%), Sarcoidosis (6.94%), Aspergillosis (1.38%). Inadequate sample was obtained in 2 cases (2.7%) Gupta et al¹³ reported granulomatous diseases in 33% cases followed by interstitial lung disease in 28% cases and non-specific inflammation in 25% cases. Kalra et al¹⁴ in their study of parenchymal lung diseases diagnosed interstitial fibrosis in 76% cases and granulomatous lesions in 32% cases.

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..

5. Conclusion

Fiberoptic bronchoscopy can be successfully employed for the diagnosis of lung diseases, including malignancies and granulomatous lesions .It is extremely useful in finding specific etiologies of various lung diseases

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