

## Diagnostic Yield Of Fibre Optic Bronchoscopy In Lung Cancer

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### Abstract:

**Background:** : FOB plays a major role in the diagnosis and staging of lung cancer. It is a minimally invasive procedure with high diagnostic yield. Various diagnostic and therapeutic procedures can be done via bronchoscope.

**Materials and Methods:** It is a retrospective observational study done over a period of 18 months in 103 patients. All the clinical details were noted and FOB findings were noted and the reports of bronchial washings, brushings and biopsy were collected and analysed.

**Results:** : Males constituted 65% of the study population. The mean age was 57.23 years. The most common symptom was cough in 79.6% of the patients. 53.39% showed mass lesion on chest X-ray. Out of 103 patients, 55 patients had findings on FOB. The diagnostic yield of bronchial washings, brushings and biopsy was 9.7%, 23.07% and 77.27% respectively. Adenocarcinoma was the most common cell type.

**Conclusion:** The overall diagnostic yield of FOB was 33%. Central lesions with endobronchial involvement had higher diagnostic yield when compared to peripheral lesions with forceps biopsy being the most yielding procedure.

**Key Words:** : FOB- Fibre optic bronchoscopy, Bronchial washings, Bronchial brushings, Forceps biopsy.

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### I. Introduction

Fibre optic bronchoscopy was introduced in late 1960's. It plays a major role in the diagnosis and management of various pulmonary diseases like hemoptysis, TB, lung cancer, etc.<sup>(2)</sup> FOB has replaced the rigid open tube bronchoscopy in the diagnosis and management of many cases. Also new techniques such as TBNA and endobronchial biopsy, instillation of drugs into cavities, will continue to expand the utility and importance of FOB.<sup>(1)</sup> Fibre optic bronchoscopy is helpful in the diagnosis and staging of lung cancer. Bronchial washings, brushings and biopsy are useful. In endobronchially visible lesions, endobronchial biopsy can be done easily with FOB. The requirement of minimal sedation, makes it an acceptable out patient procedure. Hence it has almost completely replaced rigid bronchoscopy in the initial assessment.<sup>(2)</sup> Due to the flexibility it can be advanced into deeper segments and more distal lesions can be diagnosed. TBLB can also be performed for peripheral lesions, but it is less useful.<sup>(1)</sup> The current study aims to study the diagnostic yield of bronchial washings, brushings and forceps biopsy in Lung cancer.<sup>(10)</sup>

### II. Material And Methods

This is a retrospective observational study done over a period of 18 months i.e from September 2018 to February 2020 in Government hospital for chest and communicable diseases, Visakhapatnam . A total no. of 103 patients who were diagnosed with lung cancer were included in the study. The clinical details were noted. The details of routine blood investigations, sputum examination, Chest X-Ray, HRCT chest were noted. FOB findings and the results of bronchial washings, brushings and forceps biopsy were collected and analysed.

### III. Results

#### Age and Sex distribution:

A total number of 103 patients were included in the study. Of 103 patients, majority were males constituting about 65.04% , females constituting about 34.95%. Most of the patients belonged to the age group 40-60 years. The mean age group of the patients in the study group was 57.23.

#### Symptomatology:

The predominant symptom in the study was cough which was seen in 79.6% of the patients. This was followed by shortness of breath in 60%, chest pain in 39.8%, hemoptysis in 13.59%, fever in 21.35% and hoarseness of voice in 4.85% of the patients.

**Table 1: SYMPTOMMATOLOGY**

SYMPTOM	NO.	PERCENTAGE
COUGH	82	79.6
DYSPNEA	62	60.1
CHEST PAIN	41	39.8
HEMOPTYSIS	14	13.59
FEVER	22	21.35
HOARSENESS OF VOICE	5	4.85

**Radiological Presentation:**

In the study population, the most common radiological picture was mass lesion in 53.39% of the patients. Other radiological presentations were collapse in 19.41%, unresolving pneumonia in 11.65%, hilar shadows in 9.7%, and solitary pulmonary nodule in 5.8%.

**Table 2: CHEST X-RAY FINDINGS**

TYPE OF LESION	NO.	PERCENTAGE
MASS	55	53.39
COLLAPSE	20	19.41
UNRESOLVING PNEUMONIA	12	11.65
HILAR SHADOWS	10	9.7
SPN	6	5.8

**Bronchoscopic findings:**

Fibre optic bronchoscopy was performed in all 103 patients in the study group. Of these 48(46.60%) patients had normal findings on bronchoscopy. In the remaining 55 patients, endobronchial mass was seen in 38.83%(n=40), extrinsic compression was seen in 10.67%(n=11) and inflammatory changes were seen in 3.88%(n=4).

**Procedures and Results:**

Out of 103 patients in the study, diagnosis was proven in 34 patients via brochoscopy. Bronchial washings, brushings and biopsy were the procedures done. Bronchial washings were done in all 103 patients with a positive yield of 9.7% (n=10), brushings were done in 26 patients with a positive yield of 23.07% (n=6) and biopsy was done in 44 patients with a positive yield of 77.27% (n=34).

**Table 3: PROCEDURE AND RESULTS**

PROCEDURE	POSITIVE/TOTAL	PERCENTAGE
BRONCIAL WASHINGS	10/103	9.7
BRUSHINGS	6/26	23.07
BIOPSY	34/44	77.27

In the remaining 69 patients, other methods like transthoracic lung biopsies and thoracoscopy guided procedures were used to arrive at a definitive diagnosis. Thus the overall diagnostic yield was 33 % in the study.

**Histopathology:**

Out of 34 positives in endobronchial biopsies, most common histopathological type was adenocarcinoma in 52.94% (n=18) of the patients. Squamous cell carcinoma was seen in 35.29% and undifferentiated carcinoma in 11.76% (n=4).

#### **IV. Discussion**

Fibre optic bronchoscopy (FOB) is an important diagnostic tool which helps in the diagnosis of various lung lesions ( both benign and malignant ).The expected yield from FOB depends on the location of the lesion. Central lesions with endobronchial involvement show more positive yield when compared to peripheral lesions. Combination of different techniques like bronchial washings, brushings and biopsies may have a better yield.

A total of 103 patients with a definitive diagnosis of lung cancer were included in the present study. Majority of the study population was males constituting about 65.04%. The mean age of the study population was 57.23 and the most common age group affected was 41-60 years constituting about 50.4%.This is similar to most of the previous studies.

In the present study, cough was the predominant symptom in 79.6% of patients. This was followed by dyspnea in 60%, chest pain in 39.8%, fever in 21.35%, hemoptysis in 13.59% and hoarseness of voice in 4.85%. In BJ Arun et al.<sup>(1)</sup> study, cough was the predominant symptom in 88.89% followed by dyspnea in 61%. The occurrence of cough and dyspnea were the most common symptoms in majority of the studies.

Most common radiological presentation was mass lesion accounting to about 53.39%, followed by collapse in 19.41%, unresolving pneumonia in 11.65%, hilar shadows in 9.7% and SPN in 6% of the patients. In BJ Arun et al.<sup>(1)</sup> study on role of FOB in suspected cases of lung cancer, the most common radiological presentation was mass lesion in 42.59%, followed by pneumonia in 38.89%, collapse in 16.67% and hilar adenopathy in 1.85%. In another study done by Anurag Agarwal et al.<sup>(6)</sup> mass lesion was the most common radiological presentation.

Bronchoscopy was done in all patients. Out of 103 patients, 48 (46.6%) patients had normal findings on bronchoscopy. In the remaining 55 patients, endobronchial growth was seen in 38.83% of patients, extrinsic compression in 10.67% and inflammatory changes in 3.88%. In BJ Arun et al.<sup>(1)</sup> study, endobronchial growth was seen in 44.44% of the patients, external compression in 20.37% , inflammatory changes in 18.52% and structural changes in 3.7%. Only 7.4 % of patients had normal findings on FOB compared to the present study where more number of patients had normal findings on bronchoscopy. This may be due to large sample size of the study population.

In the present study, bronchial washings, brushings and forceps biopsy were the procedures done. Bronchial washings were done in all 103 patients with a positive yield of 9.7% (n=10) which was very low. Bronchial brushings were done in 26 patients with a positive yield of 23.07% (n=6), forceps biopsy was done in 44 patients with a positive yield of 77.27%(n=34). These results were similar to the findings in Kjetil Roth et al.<sup>(8)</sup> study in which the diagnostic yield of FOB biopsy was 60.7%, brushings was 23% and bronchial washings was 6.9%. In BJ Arun et al.<sup>(1)</sup> study, the diagnostic yield of bronchial washings, brushings and biopsy were 54.13%, 85.71% and 95.65% in endobronchially visible lesions. In Mak VH et al.<sup>(4)</sup> study on diagnostic yield of FOB in lung cancer, the positive yield was 76% in biopsy, 49.6% in bronchial washings and 52% in bronchial brushings. Anurag agarwal et al.<sup>(6)</sup> study reported 78.8% positivity in forceps biopsies.

The current literature shows that the overall diagnostic accuracy of flexible FOB varies from 30-98%.In the present study, the overall yield of bronchoscopic procedures in the diagnosis of lung cancer was 33% which was relatively low compared to other studies. This could be explained by more peripherally located lesions which were not accessible through bronchoscopy and also due to the limited diagnostic procedures available at the centre.

#### **V. Conclusion**

FOB has become the mainstay investigation in the evaluation of lung cancer. It also has a role in disease staging and extended therapeutic modalities. The diagnostic yield of FOB is high in centrally located lesions with endobronchial involvement. Forceps biopsy done in endobronchially visible lesions had a higher diagnostic yield accounting to about 77.27%. Adenocarcinoma was the most common histopathological finding.

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