

## USEFULNESS OF FIBREOPTIC BRONCHOSCOPY IN HOSPITAL PRACTICE

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**Abstract: Objective:** To evaluate the usefulness of fibreoptic bronchoscopy as a diagnostic tool in a tertiary care hospital in Karachi.

**Design:** All patients presented during July 2002-June 03 with various indications for bronchoscopy were subjected to fibreoptic bronchoscopy.

**Setting:** Ojha Institute of Chest Diseases, Karachi, a tertiary care teaching Hospital, Karachi.

**Result:** A definite diagnosis was made in 70 patients (53.43%). Bronchial carcinoma was diagnosed in 39, pulmonary tuberculosis in 08, fungal infections in 02, bronchiectasis exacerbation in 09 patients. Hydatid cyst, anthracosis, chronic bronchitis was the other diagnoses.

**Conclusion:** It is a safe procedure to diagnose bronchial carcinoma, unsuspected cases of pulmonary tuberculosis and unexplained lung lesions. Squamous cell carcinoma is the most common tumour followed by small cell carcinoma. In bronchogenic carcinoma the diagnostic yield of bronchoscopically visible lesion is 75% in our setting.

### Introduction

Fibreoptic bronchoscopy is used to inspect the interior of respiratory tract, which include nasal passage, pharynx, larynx, vocal cords, trachea and bronchial tree. This invasive procedure is performed under local anaesthesia and is used for diagnostic as well as therapeutic purpose. It can be performed as an outpatient procedure or at the bedside in ICU. We retrospectively analyzed the usefulness of fibreoptic bronchoscopy as diagnostic tool in our circumstances at Ojha Institute of Chest Diseases, which is a tertiary care teaching hospital for chest diseases in Karachi.

**Material and Method:** We retrospectively analyzed one-year record of patients' undergone bronchoscopy for various indications at Ojha Institute of Chest Diseases.

The bronchoscopy record between July 2002-June 03 were analyzed for demographic data, clinical and radiological presentation, bronchoscopy finding, histopathology and cytology reports, routine and AFB cultures reports.

**Results:** A total of 131 patients with various indications for bronchoscopy were subjected to bronchoscopy. Out of 131 patients, 94 (72%) were male and 37 (28%) were female. Most of the patients were above 45 years (72%) of age with mean of 54.19 (16-95 years). Eighty-two patients (63%) were either current or ex-smokers. The commonest indication was mass (39%). Table-1 shows the other indications for bronchoscopy. 126/131 chest x-rays were abnormal while five were normal. Fifty-one Chest x-rays showed mass lesion with 37 central and 11 peripheral. Twenty-five had lobar or complete collapse of lung, twenty-eight presented with non-resolving pneumonia, eleven with fibrosis & reticulo-nodular shadowing, fifteen patients has unexplained opacity and two with cavitation resembling lung abscesses. Some of the chest x-rays showed dual pathology like hilar opacity with non-resolving pneumonia. Bronchoscopic findings were normal in 24 while

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107 patients showed some abnormality. Table-2 shows the bronchoscopic findings. Bronchial biopsy was done in 85 patients. Due to unavoidable reasons it was not possible to trace the histopathology results of 10 patients. Thirty-nine biopsies showed carcinoma lung, twenty-nine non-specific inflammation or normal, three anthracosis, one each chronic granulomatous inflammation, chronic bronchitis, acute inflammation and one unexpectedly hydatid cyst wall. The last patient x-rays reviewed and it was unexplained opacity, which was probably, infected hydatid cyst leading to unexpected result. Bronchial washings were positive for malignant cells in 33 patients. It was interesting to note that majority of patients with positive bronchial biopsy were also positive on cytology. This probably reflects poor liaison between bronchoscopist and pathologist as well as the expertise of the available cytopathologists. Cytology results were not available in 3 patients. Out of thirty-three, 14 were cell type able with seven squamous, six small cell and one adenocarcinoma. Out of thirty-three cases of bronchogenic carcinoma, the cell type was squamous cell (19), six small cell (6), four large cell (4), three adenocarcinoma (3) and one carcinoma in situ. Radiologically twenty-four patients had collapse of a lobe or whole lung. When this radiological finding was correlated with bronchoscopic findings, the endobronchial lesion was seen in 20 patients i.e. fungating mass (16), infiltrating lesion (03), nodule (01). Other had pressure effect from outside (02), fibrosis (01) and Inflamed mucosa (01). A histological diagnosis of carcinoma was confirmed in 16 (80%) patients. Nine had squamous cell, three had small cell and two had large cell. One patient was diagnosed on cytology only (Large cell) and he refused for repeat bronchoscopy. When correlating the mass lesion on Chest X-ray it was found that 37 had central while 11 had peripheral lesion. The bronchoscopic findings of central mass lesion were fungating mass (12), Infiltrating Lesion (08), Pressure effects from outside (09), Thick/pale mucosa (03), Anthracosis (01) while four patients showed no endobronchial lesion. Bronchogenic carcinoma was diagnosed in 14 (38%) patients both on histopathology and cytology. Their cell types were squamous cell (10), small cell (03) and one patient was diagnosed as carcinoma in situ. Out of eleven patients with peripheral mass lesion the histopathology was positive in two patients (adenocarcinoma) while cytology was positive in four patients with combined yield of 04/11 (36%). In cytology in three specimens' cell was not type able while one had adenocarcinoma. The remaining seven patients underwent CT guided biopsy. Carcinoma was diagnosed in three, one each of squamous, adenocarcinoma and large cell. The fourth patient also had CT evidence of malignancy. The combined yield of bronchial biopsy, bronchial wash and Ct guided biopsy in peripheral lesion was 7/11 i.e. 64%.

AFB smear was positive in seven, while culture was positive in six specimens, routine cultures were positive in 13 while fungus were grown in two patients. Out of 131 it was possible to have a definite diagnosis in 68 patients (52%), the details of the diagnosis in mentioned in table-3. We had bronchospasm in 2 patients and mild haemoptysis in 5 patients

#### **Discussion:**

The principle uses of fiberoptic bronchoscopy are both for diagnostic as well as therapeutic<sup>1</sup>. It is indicated for the diagnosis of lung cancer (abnormal chest x-rays, haemoptysis, persistent cough or recurrent cough, paralysed vocal cords and positive sputum cytology), staging of lung cancer, diagnosis of diffuse parenchymal lung disease, and identification of infecting agents. The therapeutic uses are insertion of endotracheal tube, laser therapy, brachytherapy, tamponade for bleeding, foreign body removal and aspiration of secretions. The laser three may be better carried out with rigid bronchoscope.

It is recommended that all patients undergoing Fiberoptic bronchoscopy should be clinically evaluated along with fresh chest x-ray. There are no published criteria regarding the utility of clinical

history and clinical examination. Bronchoscopy can be done as an inpatient or outpatient procedure and the safety of the latter has been well established<sup>2</sup>. It may be a high risk procedure in certain situations and the risk benefit ratio should be weighed carefully before procedure<sup>3,4</sup> like life-threatening arrhythmias, MI within the last 4 weeks, refractory hypoxaemia, platelet count <50,000, uncorrected coagulopathy, severe renal impairment<sup>5,6</sup> and uncooperative patient.

In this study 44 patients had endoscopically visible mass lesion. We did bronchial biopsy and bronchial wash only. In 31(71.45%) patients histopathology was positive. Bronchial wash was positive in 29 (66%) patients. The combined yield was 33/44 (75%). The diagnostic yield from biopsy of bronchoscopically visible tumor, in the best analysis is over 90%<sup>7</sup>. A British study in 125 bronchoscopically visible tumor found positive biopsy result in 76%, positive washings in 50% with combined yield of 95%<sup>8</sup>. In another study the yield was 95% when biopsy and bronchial wash were combined<sup>9</sup>. The possible reasons for low yield of bronchoscopically visible lesion could be small biopsy specimen, expertise of histopathologist and cytopathologist.

We have eleven patients with peripheral mass lesion the histopathology was positive in two patients (adenocarcinoma) while cytology was positive in four patients with combined yield of 04/11 (36%). Fuladi AB<sup>10</sup> reported in a recent study that ability to diagnose peripheral lesions without fluoroscopic guidance was significantly influenced by size of lesion where bronchoscopic procedures could diagnose 71.42 percent cases when lesion size was more than 4cm in diameter as compared to 33.33 percent yield where sized of lesion was less than 4 cm in diameter. In our study the size of tumour was less than 4 cm.

We were able to reach a definite diagnosis in 68 patients (52%) which is better than a study reported from Sri Lanka<sup>11</sup>. In that study the diagnostic yield was low i.e. 25.7% the reason in this huge difference is more likely due to selection criteria, experience of the operator, errors in the storage and transportation of the specimens. The problems at laboratory also cannot be rule out. Out of 39 cases of bronchogenic carcinoma, 33 (84%) was diagnosed on bronchial biopsy and combination of cytology increased the yield to 36 (92%). The reported data of bronchial biopsy and cytology yield is from 66 to 73.5%<sup>12,13</sup> and 75.4%<sup>12</sup> respectively while the combined yield is 95.8%<sup>12</sup>. Squamous cell carcinoma is the commonest cell type (57.5%) favoured by a study from Rawalpindi by Shoaib N et al<sup>14</sup>, in which squamous cell was 60%. The international data is from 35-60%<sup>15</sup>.

We conclude that bronchoscopy is a safe procedure to diagnose bronchial carcinoma, suspected cases of pulmonary tuberculosis when smear negative/no expectoration and unexplained lung lesions. Squamous cell carcinoma is the most common tumor followed by small cell carcinoma. In bronchogenic carcinoma the diagnostic yield of bronchoscopically visible lesion is 75% in our setting.

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**Table-1****INDICATIONS FOR BRONCHOSCOPY**

|                                |             |
|--------------------------------|-------------|
| Suspected endobronchial lesion | 25 (19.1%)  |
| Haemoptysis                    | 10 (07.63%) |
| non-resolving pneumonia        | 28 (21.4%)  |
| Unexplained opacity            | 15 (11.5%)  |
| Suspected Mass                 | 51 (39%)    |
| Cavitary lesion                | 02 (01.52%) |
| Total                          | 131         |

**Table-3****DEFINITE DIAGNOSIS AFTER BRONCHOSCOPY**

|                       |    |
|-----------------------|----|
| Bronchogenic Ca       | 39 |
| Pul. Tuberculosis     | 08 |
| Fungal infections     | 02 |
| Bronchiectasis exacer | 09 |
| Hydatid cyst          | 01 |
| Anthracosis           | 03 |
| Chronic bronchitis    | 01 |
| Bacterial Pneumonia   | 05 |

**Table-2****BRONCHOSCOPIC FINDINGS\***

|                             |    |
|-----------------------------|----|
| Fungating mass              | 34 |
| Infiltrative lesion         | 14 |
| Nodule                      | 04 |
| Ulcerative                  | 01 |
| Unilateral V.C Paralysis    | 09 |
| Pressure effects            | 14 |
| Inflammed                   | 11 |
| Fibrosis, pale/thick mucosa | 19 |
| Increased discharge         | 06 |
| Anthracosis                 | 04 |
| Bleeding                    | 03 |
| Normal                      | 24 |

\*some patients had more than one finding.