

## Original Research Article

# Clinicopathological profile and yield of fiberoptic bronchoscopy in 30 cases of lung carcinoma

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### ABSTRACT

**Background:** The study aims to identify the diagnostic yield of bronchoscopy along with clinico-pathological profile of 30 confirmed cases of lung cancer during a 6-months period.

**Methods:** A retrospective analysis was conducted on the diagnostic yield bronchial brushing (BB), bronchoalveolar lavage (BAL) and brush biopsy specimens obtained at fibre-optic bronchoscopy for patients with lung cancer and their clinico-pathological characteristics studied.

**Results:** Of 30 patients who underwent fibre-optic bronchoscopy examination brush cytology was diagnostic in 17 patients (68%) brush biopsy in 5 patients (20%) and BAL cytology in 4 patients (16%) with adenocarcinoma in 13 patients (43%), non-small cell carcinoma in 1 (3%), large cell carcinoma in 1 (3%), squamous cell carcinoma in 5 (16%), small cell carcinoma in 5 (16%). The most common Symptom was cough in 25 (83%) followed by chest pain in 22 (73.3%), breathlessness in 14 (46.6%), fever in 13 (43.3%), anorexia in 11 (36.6%), weight loss in 10 (33.3%), hoarseness of voice and haemoptysis in 5 (16.6%) and dysphagia in 1 (3.3%).

**Conclusions:** In bronchoscopic procedure the highest yield is of brush cytology with adenocarcinoma being the most common type with presenting complaint of cough and chest pain. The prevalence of lung cancer is more common among males and commonly being located in right upper lobe.

**Keywords:** Fiberoptic bronchoscopy, Lung carcinoma

### INTRODUCTION

Globally, Lung cancer is the largest contributor to new cancer diagnoses (1,350,000 new cases and 12.4% of total new cancer cases) and to death from cancer (1,180,000 deaths and 17.6% of total cancer deaths).<sup>1</sup> Lung cancer is one of the commonest malignancy and leading cause of cancer related deaths worldwide.<sup>2</sup> Smoking is the cause for more than 85% of the Bronchogenic carcinoma cases.<sup>3</sup>

The risk for lung cancer increased with the duration of smoking and the number of cigarettes smoked per day.<sup>4</sup> Historical trends indicate that cigarette smoking

prevalence peaked about two decades earlier in men than in women; thus, the epidemic of lung cancer started later in women.<sup>5</sup> In India, lung cancer has been considered as a less frequent entity, but an increased rate of diagnosis of lung cancer was done in the early 1960s by Viswanathan et al.<sup>6,7</sup>

The various symptoms like cough, dyspnea, chest pain and hemoptysis are common to multiple chest conditions and alone are not diagnostic of any particular disease. However, correlation between various symptoms and radiological picture may support suspicion of carcinoma lung and guide us to appropriate investigation to confirm diagnosis.<sup>8</sup>

Use of Bronchoscopy as a tool for diagnosing lung cancer is on an increasing trend with advent of Technologic advances in bronchoscopy continue to improve our ability to perform minimally invasive, accurate evaluations of the tracheobronchial tree and to perform an ever-increasing array of diagnostic, therapeutic, and palliative interventions.

The first Rigid Bronchoscopy was performed in 1887 by Gustav Killian of Freiburg, Germany.<sup>9</sup> and Fiberoptic Bronchoscopy (FOB) was developed in the late 1960s by Ikeda S which has become the mainstay investigation in the evaluation of patients suspected of lung cancer.<sup>9</sup> It is employed mainly as a diagnostic tool providing tissue to determine the histological type of tumour.

#### Aims and objectives

- To study the diagnostic yield of bronchoscopy
- To study clinical feature and pathological types of lung cancer.

#### METHODS

A retrospective analysis was carried out for 6 months on the diagnostic yield of BAL, brush cytology and brush biopsy specimens obtained by fibre-optic bronchoscopy with the Olympus BF-10 flexible fibre-optic bronchoscope (Olympus, Tokyo, Japan) for patients with lung cancer. Premedication included 0.5 mg atropine injected intramuscularly 30 minutes before bronchoscopic examination. The upper airway was anaesthetized with 2 ml of 2% lignocaine solution. Additional small quantities of 1% lignocaine were instilled through the bronchoscope for topical bronchial anaesthesia, as needed. Patients were sedated with intravenous midazolam.

The bronchoscope was inserted transnasally. When the tumour was visible bronchoscopically, bronchial washings were obtained by aspiration of any secretion and instillation, followed by immediate aspiration of two aliquots of 20 ml of sterile isotonic 0.9% saline solution at room temperature over the tumour. The aspirate was collected in a plastic specimen trap in circuit. The clinical records of the patients were analyzed duration of symptoms and signs, radiographic findings and histopathology of lung cancer.

#### RESULTS

A total of 30 cases of lung cancer underwent bronchoscopy in department of TB and Respiratory Medicine Baroda medical college and S.S.G Hospital, Vadodara, Gujarat, India.

#### Age and sex

Taking age and sex into consideration maximum number of patients with lung carcinoma were in the age group of

51-60 years totaling to 14 cases followed by 61-71 having 10 cases followed by 41-50 with 3 cases, 71-80 2 cases and 31-40 with 1 case. These cases included 25 (83%) males and 5 (16%) females (Table 1).

**Table 1 Age and sex wise distribution of patients.**

Age group (years)	Total no. of patients	Male	Female
<30	0	0	0
31-40	1	0	1
41-50	3	3	0
51-60	14	11	3
61-70	10	9	1
71-80	2	2	0
Total	30	25	5

#### Presenting complaints

The most common presenting complaint in patients of lung cancer was cough in 25 (83.3%) cases followed by chest pain in 22 (73.3%), breathlessness in 14 (46.6%), fever in 13 (43.3%), anorexia in 11 (36.6%), weight loss in 10 (33.3%), hoarseness of voice and hemoptysis in 5 (16.6%) and dysphagia in 1 (3.3%) (Table 2).

**Table 2: Presenting complaints in patients.**

Symptom	No. of patients	% of patients
Cough	25	83.3
Chest pain	22	73.3
Breathlessness	14	46.6
Fever	13	43.3
Anorexia	11	36.6
Weight loss	10	33.3
Haemoptysis	5	16.6
Hoarseness of voice	5	16.6
Dysphagia	1	3.3

#### Pathological diagnosis

The most common subtype in the studied patient population was adenocarcinoma 14 (46.6%) patients with 11 (78.5%) males and 3 (21.5%) females followed by small cell carcinoma in 5 (16.6%) with 4 (80%) males and 1 (20%) females, squamous cell carcinoma in 4 (13.3%) with 3 (75%) males and 1 (25%) females, non-small cell carcinoma and large cell carcinoma in 1 (3.3%) with 1 (100%) male bronchoscopy was non-diagnostic in 5 patients (Table 3).

#### Location of mass lesion

According to the data obtained most of the mass lesion was located in right upper lobe 13 (43.3%) patients followed by left upper lobe in 7 (23.3%) patients, right lower lobe 5 (16.6%), right middle lobe 3 (10%), left lower lobe 2 (6.6%), lingular lobe 1 (3.3%) (Table 4).

### Diagnostic method used

In the above-mentioned study, maximum patient was diagnosed with the help of brush cytology 17 (68%)

patients followed by brush biopsy 5 (20%) and BAL cytology 4 (16%). Five cases which were not diagnosed by bronchoscopy underwent CT guided biopsy for the diagnosis (Table 5).

**Table 3: Distribution of patients according to pathological diagnosis**

Diagnosis	Total number of patients	% of total	Male	% male	Female	% female
Adenocarcinoma	14	46.6%	11	78.5%	3	21.5%
Non-small cell carcinoma	1	3.3%	1	100%	0	0%
Large cell carcinoma	1	3.3%	1	100%	0	0%
Squamous cell carcinoma	4	13.3%	3	75%	1	25%
Small cell carcinoma	5	16.6%	4	80%	1	20%
Not diagnosed	5	16.6%	5	100%	0	0%

**Table 4: Distribution of location of mass lesion.**

Location of the lesion	No. of patients	%
Right upper lobe	13	43.3%
Left upper lobe	7	23.3%
Right lower lobe	5	16.6%
Right middle lobe	3	10%
Left lower lobe	2	6.6%
Lingular lobe	1	3.3%

**Table 5: Distribution of diagnostic method used.**

Name of diagnostic procedure	No. of patients diagnosed	%
Brush cytology	17	68%
Brush biopsy	5	20%
Bal cytology	4	16%

## DISCUSSION

Lung carcinoma is the most common carcinoma with a wide range of clinical symptoms. The symptoms of lung cancer can be nonspecific and thus it delays the diagnoses for patients who present with this disease.<sup>10</sup> Though most are nonspecific, however, some clues can be obtained from the history, thus raising the clinician's suspicion regarding the presence of lung cancer.<sup>11</sup> Sirsat reported that lung cancer formed one per cent of all cancers in Tata Cancer Hospital.<sup>12</sup> In present study majority of patients (46.6%) were in the age group of 51-60 years consistent with the previous studies though report of lung malignancy in younger age group are increasing.<sup>4</sup>

Cough with or without expectoration was the commonest presenting symptom in the present study, being present in 83.3% of cases. The result was similar to that reported by Jindal et al, Arora et al and Padhi N et al.<sup>13-15</sup> This may be due to the fact that even early mucosal changes induced by the tumour can result in cough. Another explanation is

that most patients are smokers and have associated chronic Bronchitis.<sup>15</sup> followed by chest pain (73.3%), breathlessness (46.6%), hemoptysis (12%), hoarseness of voice (11.6%) and fever in 13 (43.3%), anorexia in 11(36.6%), weight loss in 10 (33.3%), hoarseness of voice and hemoptysis in 5 (16.6%) and dysphagia in 1 (3.3%) comparable in frequency to other studies.<sup>16,17</sup>

Adenocarcinoma (46.6%) was found to be the commonest subtype among male and females. other entities like non-small cell carcinoma, large cell carcinoma was exclusively found in males. There has been some variation in the relative proportion of various histological subtypes in different studies. An increase in the relative proportion of adenocarcinoma has occurred in recent years. This may be due to changing smoking pattern, exposure to carcinogen other than tobacco smoke, change in the histological criteria employed etc. Lung cancer is being increasingly diagnosed in women. Adenocarcinoma has over taken SCC as the most common histological cell type.<sup>18</sup>

According to Simoff MJ more than 50% of patients with advanced-stage lung cancer will have involvement of the central airways either by bulky endobronchial disease, extension into the airways, or extrinsic compression of the airways by the tumour or by lymphadenopathy.<sup>8</sup> According to Popovich J, the yield with three or more bronchial biopsies should approach 100% for centrally located lesions.<sup>16</sup> Majority of the tumour in the study were located in right upper lobe (43.3%) followed by left upper lobe (23.3%), right lower lobe (16.6%), right middle lobe (10%), left lower lobe (6.6%), lingular lobe (3.3%) consistent with the study of Liam CK et al.<sup>19</sup>

The most diagnostic procedure in bronchoscopy is brush cytology (68%), brush biopsy (20%), BAL cytology (16%). During the study, it was observed that the expected diagnostic yield from FOB depends on the location and distribution of the tumour. Central

endobronchial lesions yield the highest diagnostic return (>90%), as compared to small peripheral lesions. More than 70% of lung carcinomas are visible to the FOB and although the yield is dependent on operator experience, a high level of diagnostic accuracy can be achieved by taking between three and five biopsy specimens and a combination of brushing, biopsy and bronchial washes can expect to establish a diagnosis in >60% of cases when the tumour is visible but is intramural rather than endobronchial in distribution, the diagnostic yield falls to 55% and is reduced further when the tumour lies beyond the bronchoscopist's vision.

Central tumours can present as exophytic mass lesions, with partial or total occlusion of the bronchial lumen, as peribronchial tumours with extrinsic compression of the airway, or with submucosal infiltration of tumour.<sup>21</sup> The changes with peribronchial tumours or with submucosal infiltration are often subtly, the airways should be examined closely for characteristic changes, such as erythema, loss of bronchial markings and nodularity of the mucosal surface. Central lesions are usually sampled with a combination of bronchial washes, bronchial brushings and endobronchial biopsies. The yield of endobronchial biopsies is highest for exophytic lesions, with a diagnostic yield of ~90%.<sup>20,21</sup>

## CONCLUSION

In bronchoscopic procedure the highest yield is of brush cytology with adenocarcinoma being the most common type with presenting complaint of cough and chest pain. The prevalence of lung cancer is more common among males and commonly being located in right upper lobe.

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