



## TO STUDY THE VARIOUS BRONCHOSCOPIC PRESENTATIONS OF BRONCHOGENIC CARCINOMA

### Pulmonary Medicine

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### ABSTRACT

**OBJECTIVE:** To study the various bronchoscopic presentations of bronchogenic carcinoma.

**METHODS:** This was a retrospective study of 82 confirmed cases of lung cancer diagnosed by various methods. The Bronchoscopic findings were categorized as endobronchial mass with complete bronchial obstruction, partial obstruction, mucosal irregularity and external compression. The lesions were further classified as per the location in the tracheobronchial tree.

**RESULTS:** 45 patients had Endobronchial lesion (54.8%). 6 patients had complete obstruction, 17 patients had partial obstruction, 14 had mucosal irregularity and 8 had external compression. Diagnostic yield was 84.44% as compared to 68% (25) in the 37 patients without endobronchial lesion. 48% (22) patients had lesion in right lower lobe. Adenocarcinoma was diagnosed in 51.1% (23) patients.

**CONCLUSIONS:** Endobronchial mass with partial obstruction was the commonest presentation. Right lower lobe was most commonly involved and Adenocarcinoma was the most common histopathological diagnosis.

### KEYWORDS:

Bronchoscopy, Bronchogenic carcinoma, Adenocarcinoma

#### Introduction

Lung cancer is presently the most common malignant disease (13% of all cancers) and the leading cause of cancer deaths (19% of all cancer deaths) in the world.<sup>1</sup>

Lung cancer is the malignancy with the highest mortality worldwide, being the only one whose incidence of death has progressively increased despite improved and more aggressive therapy in recent years.<sup>2</sup>

Because the prognosis of lung cancer is unfavorable, early diagnosis plays an important role in increasing survival in lung cancer patients.<sup>3</sup> The use of various methods can contribute to early diagnosis. Among the most commonly used methods are imaging tests (chest X-ray and CT), sputum cytology, and fiberoptic bronchoscopy. Fiberoptic bronchoscopy is currently considered the primary method for evaluating the tracheobronchial tree in patients with suspected lung cancer. In addition to allowing visualization of the lesion, the method allows the collection of cytological specimens by bronchial lavage and bronchial brushing and histological specimens by endobronchial biopsy and transbronchial biopsy.<sup>4</sup>

The objective of the present study was to study the various bronchoscopic presentations of bronchogenic carcinoma, location of the lesions in bronchial tree and common histopathological diagnosis of such lesions.

#### Methods

In this study, 82 patients with histopathologically diagnosed bronchogenic carcinoma at our tertiary care institute in two years period between 2012 and 2014 were retrospectively analyzed.

We reviewed the medical records of the patients including fiberoptic bronchoscopy reports and collected data such as age, gender, indication for the test, cytological findings, and histopathological findings.

Inclusion criteria was all the histopathologically diagnosed bronchogenic carcinoma with endobronchial lesion. Endobronchial lesion were classified as lesions with complete bronchial obstruction, with partial bronchial obstruction, Mucosal irregularity and external compression. Lesions were also classified according to their location in the tracheobronchial tree i.e trachea, left main bronchus, left upper lobe bronchus, left lower lobe bronchus, right main bronchus, intermediate bronchus, right upper lobe bronchus, middle lobe bronchus, and right lower lobe bronchus.

All bronchoscopies were performed with aseptic precautions. Patients received topical anesthesia with 10% lidocaine spray and 2% lidocaine

solution and lidocaine nebulization. The device was inserted nasally or orally, with the patient in the supine position. During the procedure, bronchial washing and transbronchial needle aspiration (TBNA) were collected for cytology and endobronchial or blind transbronchial biopsy specimens were collected for histopathology wherever indicated. After thorough inspection of the bronchial tree, samples were taken from areas showing abnormality.

Bronchial washings were collected from all the 45 patients with endobronchial lesions. Endobronchial biopsy was carried out in 23 patients, bronchial brush specimens were obtained from 14 patients and TBNA was conducted in 8 patients. All the procedures were carried out as per our department's protocol.

The histological and cytological classification of tumors was based on the criteria used by the World Health Organization.<sup>5</sup>

#### Results

Between 2012 and 2014, we retrospectively analyzed 82 patients with a confirmed diagnosis of lung cancer. Of those, 45 (54.8%) these had endobronchial presentation. Of these 31 (68.8%) were males (Table 1). The mean age was 58 years (range, 28-76 years).

**Table 1: Age and sex distribution**

Age Group (year)	Male	Female
< 40	2	2
41-60	18	7
> 61	11	5
Total	31	14

In 14 (31.1%) of the 45 diagnosed malignancy patients, the only bronchoscopic findings were those related to mucosal irregularity. 17 (37.7%) had partially obstructing endobronchial lesions whereas 6 (13.3%) had complete bronchial obstruction and 8 (17.7%) patients had only external bronchial compression without actual endobronchial presentation. (Table 2)

**Table 2: Type of endobronchial lesion**

Type of endobronchial presentation	No. of patients (%)
Endobronchial partial obstruction	17 (37.7%)
Endobronchial complete obstruction	6 (13.3%)
Mucosal irregularity	14 (31.1%)
External compression	8 (17.7%)

It was possible to determine the location of bronchoscopically visible tumors in all the 45 cases. Right lower lobe bronchus lesions (including bronchus intermedius) were present in 22 (48%) patients, followed by 7 (15%) in right upper lobe bronchus, 5 (11.1%) in right main

bronchus, 4(8.8%) in Left lower lobe bronchus, 3 (6.6%) in left main bronchus, 2 (4.4%) in left upper lobe bronchus and 1 (2.2%) in each the middle lobe bronchus and trachea.

Of the 45 patients with endobronchial lesions histopathological diagnosis by bronchoscopy was made in 38 (84.44%) patients as compared to 68% in patients without endobronchial lesion. Adenocarcinoma was diagnosed in 23 (51.1%), Squamous cell carcinoma and undifferentiated non small cell carcinoma in 7 each (15.5%), small cell carcinoma in 1 (2.2%) patients with 7 (15.5%) remained undiagnosed by bronchoscopy alone.(Table 3)

**Table 3: Histopathological diagnosis**

Type of malignancy	No. of patients (%)
Adenocarcinoma	23 (51.1%)
Non small cell carcinoma	7 (15.5%)
Squamous cell carcinoma	7 (15.5%)
Small cell carcinoma	1 (2.2%)
Undiagnosed with bronchoscopy	7 (15.5%)

Diagnostic yield of bronchial washings alone was 35.5% (16 out of 45) and none of the patients with external compression alone was diagnosed by bronchial washings.

All the 5 patients out of 8 diagnosed with TBNA had non small cell carcinoma. with external compression of airway.

Out of 14 patients with mucosal irregularity alone 7 patients had adenocarcinoma, 2 had non small cell carcinoma and remaining 2 were squamous cell variant and 3 remained undiagnosed by bronchoscopy.

Out of 23 patients with partial or complete endobronchial obstruction by the lesion, 16 had adenocarcinoma, 5 had squamous cell carcinoma, 1 had small cell carcinoma and 1 remained undiagnosed with bronchoscopy alone.

#### Discussion

We observed that there was a higher prevalence of lung cancer among males, with a male to female ratio of 2.21 in the study conducted by rabahi et al they found the ratio to be 1.464

In this study the endobronchial presentation of lung cancer was highest in the 41-60 year age group. 4 patients (8.8%) patients were from less than 40 years age group. In patients younger than 40 years of age, the incidence is lower than 5%<sup>6,7</sup> In the present study, the mean age at diagnosis was 58 years.

Regarding the endobronchial location of the lesions we found that right lower lobe bronchus (including bronchus intermedius) was the most common site followed by right lower lobe our findings differ from the studies conducted by G. Buccheri et al, where they found the most commonly affected sites were the upper lobes and the central sites of the right lung, in 28% of the cases analyzed.<sup>8</sup> According to topographic data on malignancies in patients treated at Hospital Araújo Jorge, the most commonly affected lung sites are the upper and lower lobes, as well as the main bronchi.<sup>7</sup>

Several studies in the literature have shown that the combination of the two tests results in a higher positivity rate, which ranges from 48% to 95%, depending on whether or not the lesion is bronchoscopically visible; therefore, we routinely perform lavage and biopsy or cytobrushing or TBNA.<sup>3,10</sup>

In this study the most common histological type presenting as endobronchial lesion was adenocarcinoma (in 51.1% of the cases), followed by non small cell carcinoma (not otherwise specified) and squamous cell carcinoma both (in 15.5% of the cases), the proportions being similar to those reported in other studies. Our findings differ from the study conducted by Barros JA et al where they found squamous cell variant as the commonest.<sup>7</sup>

One group of authors reported an increase in adenocarcinoma incidence, which can be higher than the incidence of squamous carcinoma.<sup>11</sup> According to Shields,<sup>12</sup> 30-50% are adenocarcinomas, 20-35% are squamous carcinomas, and 15-35% are small cell carcinomas.

One group of authors analyzed three histological types (squamous carcinoma, adenocarcinoma, and large cell carcinoma) and correlated

them with their location and endoscopic findings. Squamous carcinoma was most commonly located in the central region, and, on endoscopy, it was most commonly visualized as a tumor mass. Adenocarcinoma was most commonly located in peripheral areas and showed indirect findings, such as bronchial obstruction and external compression, which are endoscopically invisible, or no findings at all.<sup>8</sup>

We demonstrated that an endobronchial mass is the most common bronchoscopic finding that is suggestive of malignancy. Adenocarcinoma was prevalent in all the types of the endobronchial obstruction (both partial and complete), external compression and mucosal irregularity.

The findings of the present study, suggest that mean age of lung malignancies with endobronchial lesions is lower than the overall mean age of diagnosis of lung malignancies, there may be some correlation between the type of lung malignancy and the bronchoscopic appearance of the lesion and this study underlines the role of bronchoscopy and different bronchoscopic procedures for the early diagnosis of bronchogenic carcinoma.

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