

# Correlation of Bronchoscopic Findings with the Clinicoradiological Profile of the Patients Undergoing Fiberoptic Bronchoscopy in Cases of Lung Cancer

B. K. Mutha<sup>1</sup>, Sushma Duggad<sup>2</sup>, Saurabh Ambadekar<sup>3</sup> and Anand Singh<sup>3\*</sup>

<sup>1</sup>Professor and HOD, Department of TB & Chest, Dr. Vasant Rao Pawar Medical College Hospital & Research Centre Nashik, India

<sup>2</sup>Associate Professor, Department of TB & Chest, Dr. Vasant Rao Pawar Medical College Hospital & Research Centre Nashik, India

<sup>3</sup>Resident, Department of TB & Chest, Dr. Vasant Rao Pawar Medical College Hospital & Research Centre Nashik, India; anand69\_ace@hotmail.com

## Abstract

**Introduction:** Lung cancer may manifest in various ways. It may have typical symptoms such as weight loss, cough, haemoptysis and can be confused with pneumonia or it may manifest as a part of paraneoplastic syndrome. Occasionally it may be detected incidentally during evaluation for other medical illness. The early detection rate of lung cancer is rising due to cancer screening programmes, improvement in resolution of Computerised tomography scanners and also refinements in bronchoscopy techniques such as endobronchial ultrasound and electromagnetic navigation, fluoroscopy guidance and virtual bronchoscopy. The aim of this study was to correlate bronchoscopic findings with clinicoradiological profile of patients with suspected lung cancer visiting our Tertiary Health Centre, Nashik. **Materials and Methods:** This was a prospective study, conducted in a tertiary care medical college hospital over a period of 2 years. Patients were recruited from department of pulmonary medicine and referred cases from other departments were also included. **Results:** Complete data records from 52 patients were available for statistical analysis. Maximum numbers of patients were in age group 41-60. All bronchoscopies were done under local anesthesia and short conscious sedation. Majority of bronchoscopies were done in males. There were no fatal complications. Biopsy of visible growth was the most useful diagnostic tool followed by bronchoalveolar fluid. Squamous cell carcinoma was the most frequent diagnosis. **Conclusion:** Bronchoscopy is an excellent tool to evaluate lung carcinoma and multimodality approach is always helpful. Experience of bronchoscopist is crucial and accuracy of procedure increase with experience. Incidence of adenocarcinoma is increasing in India but squamous cell carcinoma remains most frequent lung cancer. Transbronchial lung biopsy, Transbronchial needle aspiration and brush biopsy, bronchoalveolar fluid aspiration are helpful tools. However the yield can be enhanced by using Endo bronchial ultrasound (ebus), fluoroscopic guidance and electromagnetic navigation, virtual bronchoscopy. There is good correlation between clinicoradiological and bronchoscopic diagnosis and early diagnosis of lung malignancy will help improve survival and quality of life of patients..

**Keywords:** Bronchoscopy, Clinicoradiological, Correlation

## 1. Introduction

Bronchoscopy is a procedure to visualize the tracheobronchial tree. There are three types of bronchoscopy: rigid, flexible, and virtual bronchoscopy. Flexible bronchoscopy is the most common type of bronchoscopy<sup>1</sup>. It visualizes the trachea, proximal airways, and segmental airways out to the third generation of branching and can be used to sample and treat lesions in those airways Figure 1. Flexible bronchoscopy is generally performed in a procedure room with conscious sedation.

Several variants of traditional flexible bronchoscopy exist<sup>2</sup>. Endobronchial ultrasound is performed using a flexible bronchoscope facilitating transbronchial needle aspiration of abnormalities such as enlarged lymph nodes. Electromagnetic navigation bronchoscopy is performed using a flexible bronchoscope with an electromagnetic guidance system. Virtual bronchoscopy consists of

computer generated pictures of the endobronchial tree, which are constructed from Computed Tomography (CT) images of the thorax. It has the advantage of being non-invasive, being able to define the airways out to the seventh generation of branching, and providing important information about structures outside the airways (eg, lymph nodes). However, it is not yet widely available and mucosal abnormalities are not well seen. Fiberoptic bronchoscopy is a procedure that allows a clinician to examine the breathing passages (airways) of the lungs. Fiberoptic bronchoscopy can be either a diagnostic procedure (to find out more about a possible problem) or a therapeutic procedure (to try to treat an existing problem or condition). The bronchoscope is now being used with lasers to help remove and destroy tumor in the lungs. Sometimes, probes can be passed through the scope to freeze bleeding sites or to shrink the tumors.

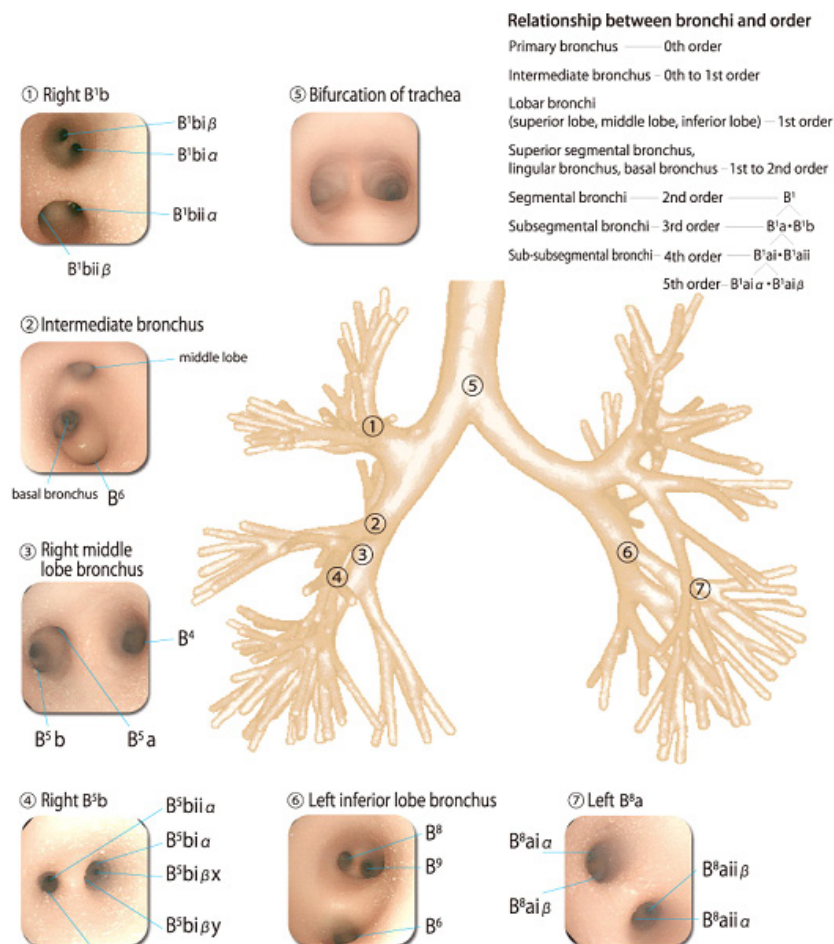


Figure 1. Normal Anatomy of the Tracheobronchial Tree.

## 2. Methods

All patients subject to bronchoscopy at our centre from July 2011 to June 2012 whose Computerised Tomography scan of thorax was suggestive of suspicious for malignancy were included in study. Informed consent for the procedure was obtained from all the patients. Patients reported fasting (at least 10 hours for solids and liquids) on the day of the procedure. Flexible bronchoscopy was performed through the nasal route, using the Pentax fibreoptic bronchoscope. For patient preparation, local anesthesia included nebulisation with 2% lignocaine solution, application of 2% lignocaine jelly nasally along with lignocaine viscous gargles and injection midazolam 3 cc intravenously and injection propofol 2cc intravenously prior to insertion of the flexible bronchoscope. Respiratory rate, heart rate, and pulse oximetric oxygen saturation was monitored throughout during the procedure. Transbronchial lung biopsy, transbronchial needle aspiration, biopsy of endobronchial growth, bronchoalveolar fluid aspiration and brush biopsy were used depending of applicability in individual cases.

## 3. Results

Fifty two patients were identified in which fibreoptic bronchoscopy was performed for a suspected diagnosis of lung cancer. Majority of patients were male. The Most common symptom in patients was cough followed by fever and weight loss. The most frequent age group was 41–60 years with the average age being 53 years. The most frequent tissue diagnosis obtained was squamous cell carcinoma followed by adenocarcinoma (Figure 2, 3). The most diagnostically yielding procedure during bronchoscopy was found to be endobronchial biopsy growth followed by transbronchial biopsy. No fatal complications occurred in any patient. The details of patients with diagnostic procedures and tissue diagnosis are summarised.

## 4. Discussion and Conclusion

This study had covered patients enrolled for diagnostic bronchoscopies, therapeutic bronchoscopies were not

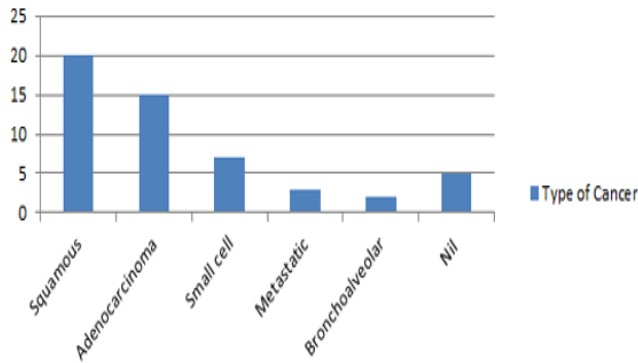
included in this study. The value of flexible fibreoptic bronchoscopy as a diagnostic tool in lung cancer is undisputed. A tumour is viewable during bronchoscopy depending upon the location and the stage at which it is performed. Visualisation of growth can vary from 37 % to 71%<sup>3-5</sup>.

In our series cases had directly visible tumour. BAL was the most commonly done procedure followed by lung biopsy of the visible growth. However biopsy of visible growth followed by transbronchial lung biopsy was found to be the most useful procedure. BAL and TBNA had lower yield than other procedures. Histologically positive results for visible tumours is reported to be high<sup>3,4</sup>. TBNA was done blindly and not under fluoroscopic or ultrasound guidance. Ikeda, et al. have shown that for visible tumours during bronchoscopy an accurate histological diagnosis can be made 85% of the time<sup>3</sup>. Jindal et al. reported squamous cell carcinoma to be the most common type followed by small cell carcinoma<sup>6</sup>. Naidich et al. showed CT bronchoscopic correlation for solitary pulmonary nodules. They showed 60 % nodules to have positive bronchus sign and were diagnosed endoscopically<sup>7</sup>. We had 5 patients of Solitary pulmonary nodule in this series of which 3 had positive bronchus sign.

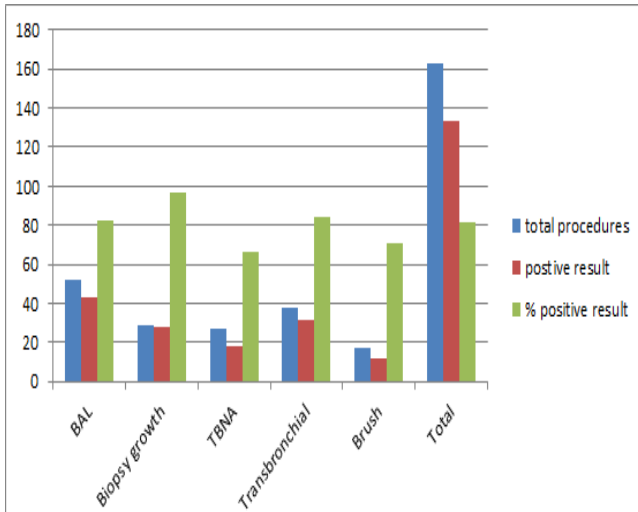
Cazzato S, et al.<sup>8</sup> showed that high-resolution computed tomography can be helpful in predicting the diagnostic accuracy of bronchological procedures, in particular of bronchoalveolar lavage and transbronchial biopsy, and that alveolar and/or ground-glass are favourable patterns for these diagnostic tools. The diagnostic yield of TBB (76%) and BAL (56%) in their study.

Clare Laroche, Ian Fairbairn et al.<sup>9</sup> showed that performing initial CT thoracic scans before bronchoscopy in patients with suspected endobronchial malignancy is a cost effective way of improving diagnostic yield. In their study bronchoscopy was diagnostic in 50 of 68 (73%).

We were able to obtain a diagnosis in 47 of 52 cases. The most common diagnosis was squamous cell carcinoma although the incidence of adenocarcinoma is increasing. A multimodality approach is the best to diagnosing lung cancer and experience of bronchoscopist is very crucial factor in diagnostic yield of bronchoscopy. The yield can improve more with the help of newer technologies like ebus, fluoroscopic guidance.



**Figure 2.** Type of lung cancer obtained from bronchoscopic specimens



**Figure 3.** Yield of Diagnostic procedures during bronchoscopy showing that among bronchoscopic procedures direct biopsy of growth was the most frequently done and successful procedure.

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