

Original Research Article

Clinicopathological, radiological and bronchoscopic evaluation of suspected lung malignancy

Stacey Boban Mathew*, Sharath K. S. Chandra, Adarsh B. Mynalli, Irfan Kandal

Department of Respiratory Medicine, Yenepoya Medical College Hospital, Mangalore, Karnataka, India

Received: 20 September 2022

Revised: 12 October 2022

Accepted: 17 October 2022

*Correspondence:

Dr. Stacey Boban Mathew,

E-mail: Stacey.boban@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: This study was conducted to evaluate the clinical, pathological and radiological profile of suspected lung malignancy and its correlation with bronchoscopic findings.

Methods: A hospital based prospective study was conducted in the department of pulmonary medicine on 74 patients who were suspected with lung malignancy, clinically or radiologically. Following a detailed clinical examination, chest x-ray and CECT thorax, patients were included in the study and were subjected to bronchoscopy. Based on the bronchoscopic findings BAL, TBNA, forceps biopsy and TBLB were performed.

Results: Out of 74 patients, most of them belonged to the age group of 51-65 years. Majority were males. Cough was the most common symptom. 51 patients had weight loss and 48 had associated reduced appetite. 50 (67.6%) were smokers. Out of them 43 (86%) were beedi smokers. In CT thorax, most common presentation was mass lesion followed by consolidation, nodules and interstitial thickening. Right side was the most common side involved. Bronchoscopy revealed intraluminal growth as the most common finding and the most common pattern noted was fungating growth. Squamous cell carcinoma was the most common cell type noted in 9 (27.03%) followed by adenocarcinoma and small cell carcinoma. Squamous cell carcinoma presented more commonly as central mass with intraluminal growth and adenocarcinoma presented more commonly as peripheral lesions with extraluminal compression in bronchoscopy.

Conclusions: Elderly smokers with cough and loss of appetite with weight loss can be suspicious of lung malignancy. CT and bronchoscopy are essential for the diagnosis of lung malignancy.

Keywords: CT thorax, Fiberoptic bronchoscopy, Lung malignancy

INTRODUCTION

Lung cancer is currently the most common malignant disease and the leading cause of cancer related deaths in all age groups and in all sexes.¹ Lung cancer accounts for 22% and 14.6% of cancer deaths in developed and developing countries respectively. Its incidence is highly correlated with cigarette smoking and about 10% of long term smokers will eventually be diagnosed with lung cancer. Lung cancer can manifest in different ways. Clinical manifestation of lung cancer result from effects of local growth of the tumor or spread through the lymphatic system, hematogenous distant metastatic

spread and remote paraneoplastic effects from tumor products or immune cross reaction with tumor antigens.² 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.³ Lung cancer manifests itself as multiple histological types as classified by conventional light microscopy.⁴ Approximately 25% of lung cancers are detected by radiographic evaluation initiated for an unrelated problem.² CT scanning is helpful in defining size, location and characteristics of the primary mass (smooth bordered, speculated, calcified), presence or absence of lymphadenopathy, abnormalities of liver, adrenal glands,

bony structures of the thoracic cavity and pleural involvement. The flexible bronchoscope is an important diagnostic tool in the evaluation of patients of lung cancer as more than 70% of lung carcinoma being approachable via bronchoscopy.^{4,5} This study was conducted to evaluate the clinical, pathological and radiological profile of suspected lung malignancies and also to determine its correlation with bronchoscopic findings.

Aims and objective

This study was conducted to evaluate the clinical, histopathological, radiological profile of suspected lung malignancies and its correlation with bronchoscopic findings.

METHODS

Study type

It was a hospital based prospective study.

Study place

This study took place at Yenepoya Medical College Hospital in the department of Respiratory Medicine, Mangalore, Karnataka, India.

Study period

The study was conducted for a period of two years from November 2018 to November 2020.

74 patients were selected for this study after getting informed consent and ethical clearance.

Selection criteria

Patients admitted to our department with suspected lung malignancy were included in this study. Lung malignancy were suspected based on their clinical and radiological presentation i.e. history of chronic cough and expectoration, hemoptysis, chest pain, dyspnoea, loss of appetite, loss of weight, history of smoking, chest x-ray-suggestive of mass, pleural effusion, non-homogenous opacities.

Following this, patients were subjected to contrast enhanced CT thorax and their findings were recorded.

Following CT thorax all these patients were subjected to flexible fiberoptic bronchoscopy and procedures like bronchoalveolar lavage, endobronchial forceps biopsy, transbronchial lung biopsy, bronchial brush were all performed

During bronchoscopy the type of lesion, site of lesion were noted.

Bronchoalveolar lavage collected were sent for cytology, culture and sensitivity.

Bronchial brush was sent for cytology.

Biopsy samples were sent for histopathology.

Patients who were already diagnosed with lung malignancy or any other malignancy and who were on treatment for the same were excluded from the study.

Statistical analysis

Data analysed by descriptive statistics such as mean, standard deviation, percentages, tables and graphs. Chi-square test used to determine association between qualitative variables. SPSS version 20.0 used for data analysis. $P < 0.05$ considered statistically significant.

RESULTS

Majority of the patients were males 60 (81.1%) (Figure 1). Most of them belonged to the age group of 51-65 years with mean age of 57.47.

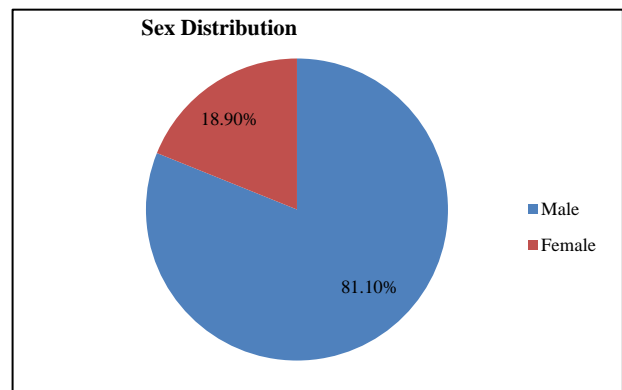


Figure 1: Sex distribution.

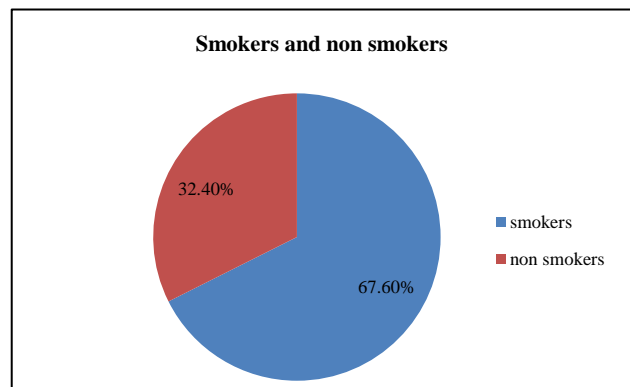


Figure 2: Distribution on the basis of smoking habit.

The most common presenting symptom was cough followed by loss of weight, loss of appetite, dyspnoea, chest pain, fever, hemoptysis, change in voice.

Majority of patients had symptoms lasting for duration of 1-6 months.

Out of 74 patients 50 (67.6%) were smokers. 24 (32.4%) were nonsmokers (Figure 2). Most of them were beedi smokers.

Right side was most commonly involved.

Most of the lesions were centrally located.

Most of the centrally located lesions were found to be squamous cell carcinoma and majority of peripheral lesions were found to be adenocarcinoma.

In CECT thorax mass was found most common presentation followed by consolidation, interstitial thickening and nodules.

Squamous cell carcinoma presented most commonly as mass lesion.

Interstitial thickening was most commonly seen in adenocarcinoma.

Table 1: Types of lesions observed.

Gross features	Number	Percentage
Intraluminal	50	67.6
Extraluminal	19	25.7

Following bronchoscopy, it was found that most of the lesions were intraluminal growth (Table 1) and most common pattern of growth was fungating type (Figure 3) followed by ulcerative, nodular, globular and plaque.

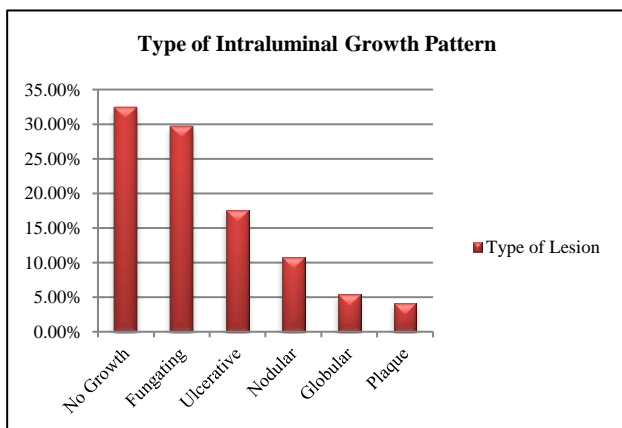


Figure 3: Type of intraluminal growth pattern.

Squamous cell carcinoma presented most of the times as intraluminal lesion followed by adenocarcinoma and small cell carcinoma.

Extraluminal compression in bronchoscopy was most commonly seen in adenocarcinoma followed by squamous cell carcinoma.



Figure 4: Intraluminal growth.



Figure 5: Intraluminal growth.

Squamous cell carcinoma was found to be most common histological cell type followed by adenocarcinoma and small cell carcinoma.

DISCUSSION

In this hospital-based study 74 patients who were suspected to have lung malignancy were included. Various important aspects which were addressed in this study were the clinical profile of patients suspected to have lung malignancy, CECT thorax findings and its correlation to the various histological types of lung malignancy. The pattern of bronchoscopic appearances of various histological types and the various bronchoscopic procedures used for the attainment of diagnosis were also addressed.

Clinical profile

Age and gender

Most of our patients belonged to the age group of 51-65 years with a mean age of 57.7 (Figure 1) and standard deviation of 12.6. In this study majority were males 81.1% and females 18.9%. This is similar to the study conducted by Kumar et al where maximum patients

belonged to the age group of 41-60 years and that most of them were males.⁴ In another study conducted by Hafez et al in Egypt found that the mean age of the patients was 56.9±6.7 years, there was male predominance (76.4%).⁵

Symptomology

Analysis of these patients showed that cough was the most common symptom which was seen in 67 patients (90.5%), followed by sputum production in 57 (77%). This is consistent with the study conducted by Hafez et al.⁵ Also similar finding was observed by Kumar et al where cough was the most common presenting symptom.⁴

Cough was followed by dyspnoea which was present in 47 patients (63.5%), hemoptysis was present in 8 of them. Change in voice was present in 4 (5.4%) patients. These were the symptoms which were also observed by Mandal et al in their study.⁶

Duration of symptoms

In our study it was seen that, 55 (74.3%) patients had symptoms lasting for duration of 1-6 months at the time of presentation. 12 (16.2%) patients had symptoms for less than 1 month and 7 (9.5%) patients had symptoms for more than 6 months. This observation was similar to what was Sisodia et al in which 35 patients were having symptoms for 1-6 months 6 patients was having symptoms since more than 6 months and 9 patients had symptoms less than 1 month.⁷

Smoking

In this study out of 74 patients 50 (67.6%) were smokers (Figure 2). Our country is known to have more beedi smokers than cigarette smokers, which was also the case in our study. Out of the 50 smokers it was found that 43 (86%) were beedi smokers and 7 (14%) were cigarette smokers.

Radiological profile

CECT thorax

Side involved

It was found that the most common side involved was the right side in 42 (56.8%) patients. Bilateral lung involvement was seen in 5 (6.8%) patients. Similar finding was observed in a study conducted by Kumar et al where majority of lesions were involving the right lung (65.79%).⁴ Sarfraz et al in their study also observed that right lung was most commonly involved 37 (67.3%).⁸

Pleural effusion

In our study 24 (32.4%) out of 74 patients had pleural effusion. Similar to another study done by Dhandapani et

al pleural effusion was seen in 27.8% of patients.⁹ Kumar et al in their study found that pleural effusion was seen in 24.5% patients.⁴

CECT thorax- lesions

Most common CECT thorax finding was mass lesion 60 (81.1%) followed by consolidation in 19 (25.7%), nodules were seen in 8 (10.8%) patients and interstitial thickening in 7 (9.5%). Similarly, Sarfraz et al in their study observed that mass lesion was the most common radiological finding in 37 (67.3%) cases followed by collapse in 11 (20%) cases.⁸ Omar et al in their study found that mass lesion was recorded in 45.9%, pleural effusion in 24.7%, collapse in 9.4% and consolidation in 7.1% of the patients.¹⁵ Similar observation was also made by Kumar et al in their study where radiologically, most common presentation was a mass or space occupying lesion in 154 patients (57.89%).⁴ Dhandapani et al too in their study found that lung cancer most commonly presented as a mass (n=44, 81.5%) followed by nodules (n=20, 37%), pleural effusion (n=15, 27.8%) and consolidation (n=4, 7.4%).⁹

Metastasis

In this study out of 74 patients studied, 6 (8.1%) had metastasis. Similar finding was observed by Sarfraz et al in their study where they found that metastasis was seen in 5 (6.25%) patients.⁸ However in a study conducted by Kumar et al metastasis was found in 43.7 patients.⁴

Bronchoscopic profile

In our study all 74 patients had undergone flexible fiberoptic bronchoscopy and it was found that 50 (67.6%) patients had intraluminal growth pattern (Table 1) (Figures 4 and 5) in which 22 (29.7%) had fungating growth, 13 (17.6%) had ulcerative pattern, 8 (10.8%) had nodular pattern, globular was seen in 4 (5.4%) patients. In 3 (4.1%) intraluminal growth was seen as plaque over the bronchial mucosa.

Similar observation was made by Rana et al where 17 (34%) had fungating growth and 6 (12%) had globular lesions, nodular lesions were detected in 14 (28%) cases, and ulcerative/plaque lesions were detected in 13 (26%) cases.¹⁰ Similarly in a study conducted by Sarfraz et al endobronchial mass lesion was found as the most common bronchoscopic finding which was detected in 68 (85%) patients.⁸ In our study malignancy in BAL cytology was detected only in 1 (1.4%) patient.

In our study 19 (25.7%) patients had extraluminal compression. This was similar to what was seen in a study conducted by Omar et al where out of 141 cases, extrinsic compression was seen in 10 (7.1%) cases.¹⁵ Similarly Gupta et al in their study extrabronchial compression was present in 25 (25.5%) cases.¹²

Histopathology

In our study out of 74 patients squamous cell carcinoma was found to be the most common lung malignancy detected and was present in 20 (27.03%) patients followed by adenocarcinoma in 8 (10.81%), small cell carcinoma in 7 (9.46%). Similar results were observed in many studies. In a study conducted by Gupta et al it was seen that squamous cell carcinoma was found to be the most common type of lung carcinoma and was found in 77 (45.3%) cases which was followed by adenocarcinoma present in 60 (35.3%) cases.¹² Furrugh et al in their study also found that the most common histopathological cell type was squamous cell carcinoma (37.4%) which was followed by adenocarcinoma (29.5%) and small cell carcinoma (14.9%).¹⁴

However, Kumar et al had a different observation where adenocarcinoma was found to be the most common histological subtype in 45 (40.9%) patients followed by squamous cell carcinoma (32.7%) and small cell carcinoma (20%).⁴

In our study most of the lesions were centrally located 51 (68.9%) and 22 (29.7%) were located peripherally. Squamous cell carcinoma was the most common histological type to be presented as central lesion in 19 patients followed by small cell carcinoma and adenocarcinoma. Adenocarcinoma presented mostly as peripheral lesions, in 6 of the patients with peripheral lesions, squamous cell carcinoma was detected. Gupta et al in their study observed that squamous cell carcinoma presented more commonly as a central tumor (75% cases), while adenocarcinoma presented more commonly as peripheral mass lesion (64.5% cases).¹²

CONCLUSION

It can be concluded that lung malignancy presented as chronic cough, loss of appetite and loss of weight in elderly smokers. Clinical features and radiological investigations point towards lung malignancy, however correlating these with bronchoscopic findings and histopathology is important for the diagnosis of lung malignancy.

ACKNOWLEDGEMENTS

I would like to thank Dr. Irfan. K (Professor and Head of the department of pulmonary medicine), Dr. K. S. Sharath Chandra (senior resident), Dr. Adarsh B. Mynalli (assistant professor) for all their kind help, assistance and guidance throughout this study. I would also like to thank all my patients who participated in this study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee of Yenepoya (Deemed to be University)

REFERENCES

- Acharya V, Unnikrishnan B, Shenoy A, Holla R. Utility of various bronchoscopic modalities in lung cancer diagnosis. *Asian Pacific J Cancer Prev: APJCP*. 2017;18(7):1931.
- McWilliams A, Lam B, Sutedja T. Early proximal lung cancer diagnosis and treatment. *Euro Resp J*. 2009;33(3):656-65.
- Kitahara Y, Murakami Y, Nakai S, Hiramatsu T, Kishimoto Y, Nihashi F, et al. Endobronchial Small-cell Lung Cancer with Intraluminal Growth Pattern Showing "Finger-in-glove" Appearance. *Int Med*. 2020;59(5):701-4.
- Kumar BS, Subrata C. Study of Lung Cancer in a rural Medical College in hilly area of West Bengal. *Cough*. 2018;174:71-90.
- Hafez MR, Abo-Elkheir OI. Clinical, radiological, laboratory and bronchoscopic features characterizing each type of bronchogenic carcinoma. *Int J Res Med Sci*. 2017;5(12):5107-16
- Mandal SK, Singh TT, Sharma TD, Amrithalingam V. Clinico-pathology of lung cancer in a regional cancer center in Northeastern India. *Asian Pac J Cancer Prev*. 2013;14(12):7277-81.
- Sisodia JA, Solanki RN, Patel MM. A Retrospective analytical study of prospectively collected data of patients of Lung Carcinoma confirmed by Histologically carried out at BJ Medical College, Ahmedabad, Gujarat. *Int J Res Med*. 2014;3(2):84-7.
- Sarfraz S, Gupta R, Bhardwaj S. Histopathological patterns of endobronchial. *Int J Contemp Med Res*. 2018;5(11):1-5.
- Dhandapani S, Srinivasan A, Rajagopalan R, Chellamuthu S, Rajkumar A, Palaniswamy P. Clinicopathological profile of lung cancer patients in a teaching hospital in South India. *J Cardio-Thor Med*. 2016;4(2):440-3.
- Kumar M, Sharma DK, Garg M, Jain P. Clinicopathological Profile of Lung Cancer—Changing Trends in India. *Int J Res Med*. 2016;5(2):57-62.
- McWilliams A, Lam B, Sutedja T. Early proximal lung cancer diagnosis and treatment. *Euro Resp J*. 2009 Mar 1;33(3):656-65.
- Gupta V, Bhardwaj S, Bhagat OK. Pattern of transbronchial lung biopsy-proven lung malignancies in tertiary care hospital in north India: a clinicopathological study. *Int J Adv Med*. 2016;3(4):804-7.
- Mohan A, Garg A, Gupta A, Sahu S, Choudhari C, Vashistha V, Ansari A, Pandey R, Bhalla AS, Madan K, Hadda V. Clinical profile of lung cancer in North India: A 10-year analysis of 1862 patients from a tertiary care center. *Lung India*. 2020;37(3):190.
- Furrugh M. Tobacco smoking and lung cancer: perception-changing facts. *Sultan Qaboos Univ Med J*. 2013;13(3):345.

15. Calvin Davidsingh S. Bronchogenic carcinoma: Clinical, Radiological and Pathological Correlation (Doctoral dissertation, Coimbatore Medical College, Coimbatore). 2009.

Cite this article as: Mathew SB, Chandra SKS, Mynalli AB, Kandal I. Clinicopathological, radiological and bronchoscopic evaluation of suspected lung malignancy. *Int J Res Med Sci* 2022;10:2611-6.