

PROFILE OF RADIOLOGY AND HISTOPATHOLOGY OF PULMONARY MASS LESIONS IN A TERTIARY CARE CENTRE

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ABSTRACT

Background: A pulmonary mass lesion is as an opacity of more than 3 cm in diameter radiologically. Bronchogenic carcinoma is the commonest diagnosis of pulmonary mass, which is of two major histologic groups: non- small cell (NSCLC) and small cell lung carcinoma. NSCLC is further subdivided into the following histologic types: squamous cell carcinoma, adenocarcinoma and large cell carcinoma. **Aim:** To evaluate the radiology and histopathology of pulmonary mass lesion among patients attending tertiary care centre. **Objective:** To study the various radiological presentations when compared to the histopathological report. **Materials and Methods:** This retrospective study was performed using a database of 50 patients of pulmonary mass lesions who have attended our hospital from January 2023 to July 2024, after obtaining ethical clearance from Institutional Ethics Committee. Clinical records of the patients were received for demographic data, occupational history, smoking history, duration of symptoms and signs, radiographic findings, histopathology. For confirmation of diagnosis of mass lesion, patients were subjected to Fiber-optic bronchoscopy and transthoracic biopsy under imaging guidance. **Results:** In a total of 50 members in the study, the most common age group being above 60 was (46%) with male preponderance (76%) in which smokers were (54%). The most common symptom was dyspnoea (54%) followed by loss of appetite and weight loss (38%). The most common radiological presentation was mass lesion (58%) and the most common histopathological type was squamous cell carcinoma 15(30%) followed by adenocarcinoma 12(24%) and small cell carcinoma 3(6%). **Conclusion:** This study shows that Squamous cell carcinoma is the frequent histopathological type. Smoking still remains the major risk factor in pathogenesis of lung cancer. Take home message: Carcinoma lung is still being misdiagnosed as tuberculosis and treated by antitubercular treatment, this emphasized the need for more effective methods for early detection of lung cancer cases with Low dose CT screening of symptomatic and current smokers or those hailing from risky occupation and demographic area among general population.

INTRODUCTION

Lung cancer is the second most prevalent malignancy and remains the foremost cause of cancer-related mortality worldwide.^[1] According to estimates by the International Agency for Research on Cancer (IARC) and the Global Cancer Observatory (GLOBOCAN), approximately 2.2 million new cases and 1.8 million deaths were attributed to lung cancer in 2020.^[1]

The initial diagnostic modality is typically a chest radiograph.^[2] However, the abnormalities can be accurately visualized through contrast-enhanced

computed tomography (CT) or positron emission tomography-computed tomography (PET-CT) scans. Definitive diagnosis necessitates histopathological and immunohistochemical evaluation.^[2]

Traditionally, lung cancer was broadly categorized into non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC). However, the emergence of histology-driven molecular targeted therapies has rendered this classification increasingly insufficient. As a result, detailed histopathological and genomic profiling of lung tumours has gained prominence.^[4] The implementation of targeted therapies or

immunotherapies is largely guided by mutation subtype analysis. Additionally, a shift in histological patterns has been observed, with adenocarcinoma now matching or surpassing squamous cell carcinoma in prevalence, particularly in several Asian and most Western nations.^[5]

Aims and Objective

- To evaluate the radiology and histopathology of pulmonary mass lesions among patients attending tertiary care centre.
- To study the various radiological presentations when compared to the histopathological report.

MATERIALS AND METHODS

Inclusion Criteria

- All the patients presenting with mass lesions on chest radiograph which are persistent even after appropriate antibiotic therapy.

Exclusion Criteria

- Patients with already diagnosed malignancy.
- Patients with bleeding diathesis.

Patients and Methodology

This study was performed using data of 50 patients of Pulmonary mass lesions retrospectively who have attended to Pulmonary Medicine Department, GGH, Kakinada from January 2023 to July 2024, after obtaining ethical clearance from Institutional Ethics Committee IEC/RMC/2025/1379. The clinical records were received after obtaining permission from competent authorities and data like demography, occupational history, smoking history, duration of symptoms and signs, radiographic findings, histopathology and details of the procedure done to obtain the sample were collected and were analysed by using SPSS software.

Histological diagnosis

Table 1

Final diagnosis	Frequency	Percentage
Squamous	15	30%
Adenocarcinoma	12	24%
Small cell carcinoma	3	6%
OTHERS	20	40%
Chronic inflammation	3	12%
Tubercular etiology	5	21%
Malignant epithelial deposits	1	4%
Cell type undetermined	4	17%
Non-Hodgkin lymphoma	1	4%
Paucicellularity	1	4%
Poorly differentiated	2	8%
Reactive mesothelial lining cell clusters	1	4%
Small round blue cell tumour	1	4%
Spindle cell sarcoma	1	4%
Cytology- negative	2	8%

Histopathological analysis revealed squamous cell carcinoma as the most common subtype (30%),

RESULTS

A total of 50 patients with pulmonary mass lesions were evaluated in this study. The majority of patients (46%) were above the age of 60 years, followed by 44% between 41–60 years, and 10% below 40 years. Males constituted 76% of the study population, and rest were females.

Smoking status: Among the study participants, 54% (27) of the patients were smokers and 46% (23) were non-smokers.

Descriptive analysis of symptoms:

Among the study population, the most common symptom was dyspnea (54%), followed by loss of weight and appetite (38%), hemoptysis (34%), cough (30%), chest pain (26%), and fever (24%).

Radiology: Chest radiograph revealed isolated mass lesions in 58% of patients, and accompanying patterns like pleural effusion in 30%, consolidation in 18%, and collapse in 8%. Right lung was involved in (25) 50% of cases, left lung in (24) 48%, and bilateral involvement was noted in only one patient accounting for 2%.

Analysis for investigative procedures:

Biopsy	Frequency	Percentage %
USG Guided Biopsy	20	40.00%
USG guide Fnac	12	24.00%
Pleural fluid cytology	11	22.00%
Fibre Optic bronchoscopy	4	8.00%
Pleural Biopsy	3	6.00%
Total	50	100.00%

The diagnostic modalities employed included USG-guided biopsy in 40% of cases, USG-guided FNAC in 24%, pleural fluid cytology in 22%, fiber-optic bronchoscopy in 8%, and pleural biopsy in 6%.

followed by adenocarcinoma (24%) and small cell carcinoma (6%).

Other diagnoses accounted for 40% of cases and included chronic inflammatory changes (12%), tubercular aetiology (21%), cell type undetermined (17%), and various rare findings such as spindle cell sarcoma, non-Hodgkin lymphoma, and cytology-negative results.

DISCUSSION

Among the 50 patients included, individuals over the age of 60 comprised the majority, consistent with previous Indian studies by Jindal et al,^[6] (37.50%), Malik et al,^[7] (36.6%), and Hathila et al,^[8] (50.76%). Males were more commonly affected than females, aligning with findings from studies conducted by Viswanathan et al,^[9] and Yadav et al,^[10]

Tobacco use, including smoking of cigarettes, beedis, and consumption of other tobacco products, emerged as the leading risk factor.

The most frequently reported symptoms in our study were breathlessness, followed by weight loss, anorexia, haemoptysis, cough, chest pain, and fever. Beckles et al,^[4] noted that 6%–25% of lung cancer patients may report bone pain, 20%–49% may present with chest pain, and 3%–60% may experience dyspnoea.

In our study one patient had coexisting tuberculosis and squamous cell carcinoma, and appropriate treatment for both was initiated. Similar delays in diagnosis have been observed by Rawat et al,^[11] where misdiagnosis as tuberculosis at other centres led to delayed management, typically ranging from 4 to 6 months.

Table 2: Comparison of chest x-ray findings with other Indian studies

Chest radiograph	Chandramouli et al ^[20]	Sharma et al ^[21]	Saha et al ^[22]	This study
Right lung lesion	60%	54.20%	73.03%	50.00%
Left lung lesion	40%	38.30%	22.12%	48.00%
Mass	58%	49.90%	26.92%	58.00%
Pleural effusion	22%	8.80%	10.58%	30.00%
Consolidation	14%	14.20%	18.27%	18.00%
Collapse	0	0	0	8.00%

Bronchoscopy remains a vital tool for evaluating suspected endobronchial lung cancers. However, tumors located beyond bronchoscopic reach necessitated alternative diagnostic methods.^[12] CT-

guided Fine Needle Aspiration Biopsy (FNAB) is preferred for peripheral lesions despite its high complication rates, as documented in both international,^[13-15] and Indian literature.^[16,17]

Table 3: Comparison of distribution of histological types of lung cancer in Indian studies

Cancer cytology	Mohan et al ^[5]	Bhadke et al ^[18]	Hathila et al ^[8]	Mohan et al ^[19]	Chandramouli et al ^[20]	This study (n=50) %
	(n = 397), %	(n = 94), %	(n = 65), %	(n = 1,862), %	(n=50) %	
Squamous	25.1	32	61.53	28.6	48	30
Adeno	24.1	48	27.69	34	42	24
Small cell	14.6	8	6.15	16.1	6	6
Large cell	1.7	2	3.07	NA	0	0

In our study, bronchoscopy had a diagnostic yield of only 8%, whereas image-guided biopsy was more effective, diagnosing 40% of cases. This discrepancy is likely due to the peripheral location of most lesions in our sample.

The histologic profile of lung cancer has evolved in Western populations—with rising incidence in women and adenocarcinoma surpassing squamous cell carcinoma (SCC) as the predominant type.^[20] However, the pattern seen at our hospital indicates squamous cell carcinoma as the most frequent subtype, followed by adenocarcinoma and small cell lung carcinoma. Prior Indian studies report similar trends (table 2). This difference in histopathology may be attributed to lower smoking rates among Indian women, in contrast to western demographics, and differences in exposure to carcinogens and socio-environmental factors.

CONCLUSION

In our study squamous cell carcinoma is the most common histology form with smoking as major risk factor and adenocarcinoma is most common among females and non-smokers.

Take home message: Mass lesions on chest radiographs are being misdiagnosed as tuberculosis and started on Anti Tubercular Treatment which is causing diagnostic delay of malignancies. Hence, malignancy should be ruled out in all patients with mass lesions and risk factors, to avoid diagnostic delay and to improve the quality of life.

Limitations

Though adenocarcinoma is in rise in recent times, occurrence of squamous cell carcinoma as most common histopathological form in our study might be due to small sample size.

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