



HISTOPATHOLOGICAL STUDY OF GUIDED LUNG BIOPSIES IN TERTIARY CARE HOSPITAL

Pathology

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ABSTRACT

BACKGROUND: Globally, lung cancer is one of the commonest cancer and cause of cancer related deaths constituting 13 per cent of all new cancer cases and 19 per cent of cancer related deaths worldwide.

METHODOLOGY: This observational study was conducted in the Department of Pathology, Rural Medical College, Maharashtra from January 2019 to December 2020. All CT and USG guided malignant biopsies were included in this study and all non-neoplastic condition were excluded from this study.

RESULTS: In present study of 47 cases of malignant lung biopsy, the most common malignant lesion was adenocarcinoma (34 cases, 72%) followed by squamous cell carcinoma (6 cases, 12.7%). Age range varied from 32-80 years with majority of the cases were in the age group of 61-70 years followed by 71-80 years. The youngest patient was 32 years of age whereas the oldest patient was 80 years of age. Out of total 47 malignant cases in this study, 23 (48.9%) were male and 24 (51%) were female patients with male to female ratio of 0.9:1.

CONCLUSIONS: Lung biopsies play an important role in accurate diagnosis and subtyping of lung lesions.

KEYWORDS

Lung biopsy, Guided biopsy, Lung cancer

INTRODUCTION:

Globally, lung cancer is one of the commonest cancer and cause of cancer related deaths. It constitutes 13 per cent of all new cancer cases and 19 per cent of cancer related deaths worldwide. In India, its incidence is rising, with incidence rate of 6.9 per cent and 9.3 per cent of all cancer related mortality in both sexes. Its highest incidence is reported in Mizoram in both males and females.¹ In 2001-02, National Cancer Registry Programme of the Indian Council of Medical Research (ICMR) has reported that North-east states are 'hot-spots' for lung cancer.²

Lungs lesions are common as lungs are exposed to multiple risk factors including smoking, pollution, human immunodeficiency virus (HIV), infections, tuberculosis, and malnutrition. Computed tomography (CT) guided lung biopsy is quick, reliable, simple technique with less complications associated with diagnosis of pulmonary pathologies. Histopathological examination plays an important role in arriving at a correct and accurate diagnosis of various pulmonary lesions further impacting management of patients with pulmonary lesions.²

Lung carcinomas were traditionally classified into histopathological subtypes using standard histological techniques as -a.) Small cell carcinoma (SCLC) and b.) Non-small cell lung carcinomas (NSCLCs). The most critical step in histopathological diagnosis was to distinguish SCLC from the NSCLC as patients with the former underwent chemotherapy, whereas patients with the latter are potential candidates for surgery or various chemotherapies. This led to integration of conventional histopathological analysis with immunohistochemical (IHC) markers of squamous (like p63, cytokeratin (CK) 5/6) and glandular (TTF-1, CK7) cell differentiation, thus allowing accurate identification of particular histotype.³

In present study, histopathological analysis of lung lesions in guided small biopsies was conducted in accordance with age and sex.

METHODOLOGY:

This observational study was conducted in the Department of Pathology, Rural Medical College, Maharashtra from January 2019 to December 2020.

Inclusion criteria: All CT guided and USG guided malignant biopsies were included in this study.

Exclusion criteria: All Non-neoplastic condition were excluded from this study.

The available histopathology slides and case history were retrieved from the archives and were reviewed by independent pathologist. Slides were reviewed on the basis of morphology and available IHC (TTF-1, Napsin A, CKAE1/AE3 and P63).

RESULTS:

In present study of 47 cases of malignant lung biopsy, according to the histopathological diagnosis, the most common malignant lesion in this study was adenocarcinoma (34 cases, 72%) [Figure 1] followed by squamous cell carcinoma (6 cases, 12.7%) (Table no.1)[Figure 2]. Age range varied from 32-80 years with majority of the cases were in the age group of 61-70 years followed by 71-80 years. The youngest patient was 32 years of age whereas the oldest patient was 80 years of age. Table no. 2 indicates age distribution of histopathological subtypes. Out of total 47 malignant cases in this study, 23 (48.9%) were male and 24 (51%) were female patients with male to female ratio of 0.9:1. Table no. 3 shows sex distribution of histopathological subtypes. Immunohistochemical markers TTF-1 [Figure 3] and Napsin A [Figure 4] was found out to be positive in all 34 cases of adenocarcinoma.

Table 1: Most common histopathological subtype

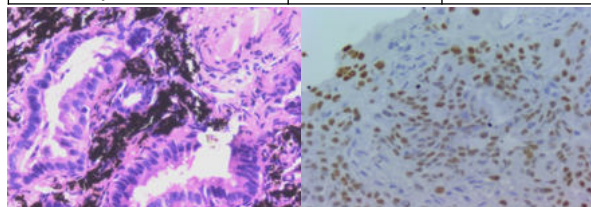
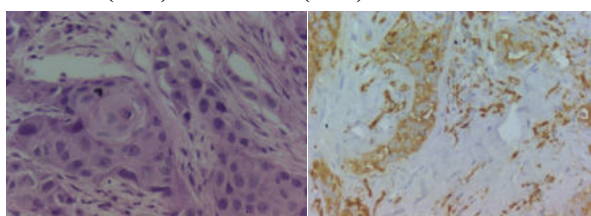
Diagnosis	Number	Percentage
Adenocarcinoma	34	72%
Squamous cell carcinoma	6	12.7%
Poorly differentiated carcinoma	3	6.3%
Small cell carcinoma	1	2.1%
Non-small cell carcinoma	1	2.1%
Malignant mesothelioma	1	2.1%
Adenoid cystic carcinoma	1	2.1%

Table 2: Age wise distribution of Histopathological Subtype

Diagnosis	31-40 yrs	41-50yrs	51-60 yrs	61-70 yrs	71-80yrs
Adenocarcinoma	11	1	10	18	14
Squamous cell carcinoma	0	1	1	3	1
Poorly differentiated carcinoma	0	0	1	2	0
Small cell carcinoma	0	0	0	1	0
Non-small cell carcinoma	0	0	1	0	0
Malignant mesothelioma	0	0	0	0	1
Adenoid cystic carcinoma	0	0	0	1	0

Table 3: Sex distribution of Histopathological Subtype

Diagnosis	Male	Female
Adenocarcinoma	14	20
Squamous cell carcinoma	5	1
Poorly differentiated carcinoma	2	1
Small cell carcinoma	1	0
Non-small cell carcinoma	1	0
Malignant mesothelioma	0	1
Adenoid cystic carcinoma	0	1

**Figure 1: H&E image Adenocarcinoma (400X)****Figure 3: TTF-1 IHC Marker (400X)****Figure 2: H&E image Squamous Cell Carcinoma (400X)****Figure 4: Napsin-A IHC Marker (400X)****DISCUSSION:**

There were total 47 cases during the study period of 2 years. In India, the incidence of lung cancer is rising due to high prevalence of smoking. It is accountable as the third largest cause of cancer related mortality.⁴

In the present study Adenocarcinoma was the most common malignancy accounting for 34 cases out of 47 cases (72%) followed by Squamous cell carcinoma (6 cases, 12.7%) which was consistent with studies done by Krishnamurthy et al⁵, Banerjee et al⁶, Bordini et al³, B. Garima et al⁷ and Lad et al². Whereas studies by Shah et al⁸, Chandramouli et al¹, Malik et al⁹, Bhatti et al¹⁰ showed squamous cell carcinoma as most common histologic type followed by adenocarcinoma. In the western countries and most of the Asian countries, adenocarcinoma has surpassed squamous cell carcinomas. The decreased incidence of smoking in men, the increased incidence of smoking in women, along with changes in the composition of cigarettes, and the implementation of filters are suggested to be responsible for the observed changes.³

It has been postulated that the use of filtered cigarettes has caused an increase in the incidence of adenocarcinoma, which is usually located in the peripheral lung, because smokers now need to inhale more deeply to achieve a comparable effect.³

In the present study majority of lung cancer were seen in 6th to 7th decade, which was consistent with studies done by Lad et al² and Chandramouli et al¹. A study by Shah et al⁸ concluded with majority of the cases in 5th to 6th decade. A study by B. Garima et al⁷, Banerjee et al⁶ and Krishnamurthy et al⁵ concluded majority of the cases in 4th to 6th decade. A study by Bhatti et al¹⁰, Malik et al⁹ concluded majority of cases in 5th to 7th decade. As patients of rural area tend to come at a later stage so most of the cases in present study were seen in 6th to 7th decade. In present study Adenocarcinoma and Squamous cell carcinoma was common in 6th to 7th decade while study by Bhatti et al¹⁰ show Adenocarcinoma was common in 5th to 6th decade while Squamous cell carcinoma was common in 6th to 7th decade.

Male to female ratio in the present study was computed as 0.9:1 whereas study by B. Garima et al⁷, Shah et al⁸, Krishnamurthy et al⁵, Lad et al², Malik et al⁹, Banerjee et al⁶, Bhatti et al¹⁰, Chandramouli et al¹ show male to female ratio varying from 2:1 to 6.6:1 that is higher than the present study.

In present study adenocarcinoma was more common in females while squamous cell carcinoma was more common in males whereas study by Shah et al⁸, Bhatti et al¹⁰ and Bordini et al³ show both

adenocarcinoma and squamous cell carcinoma are more common in males.

When comparing the characteristics of lung cancer cases, squamous cell carcinoma was the predominant type of lung cancer among men but women were found to be more likely to have adenocarcinoma as compared to men which was consistent with study by Lad et al².

In the present study all cases of adenocarcinoma show TTF-1 and Napsin A positivity which was consistent with study by Bhatti et al¹⁰, so TTF-1 and Napsin A are good markers for diagnosis of adenocarcinoma.

Over the past years, the emergence of targeted or combination treatment strategies has created new demands on histopathological diagnosis, as it is now recognized that the efficacy and toxicity of new drugs are related to the histological type.³

Newer molecular targets and driver mutations have been identified which play a major role in pathogenesis that can be addressed with therapeutic interventions.¹

CONCLUSION:

Lung biopsies play an important role in accurate diagnosis and subtyping of lung lesions. Immunohistochemistry is an important complimentary tool for routine diagnosis of lung carcinomas. The most common histological subtype was Adenocarcinoma and it was more common in females.

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